

The Canadian Medical Association Journal

Vol. 59

SEPTEMBER, 1948

No. 3

THE PRACTICE OF SURGERY IN CANADA*

W. E. Gallie, M.D. (Tor.), D.Sc. (McGill),
F.R.C.S. [Eng. & C.], P.A.C.S.

Toronto, Ont.

BEFORE launching into the subject of my lecture let me tell you of the thrill of pleasure that the letter from the General Secretary inviting me to deliver the Lister Oration gave me. It is just forty years since I made my first presentation to the Association and I recall vividly the anxiety I suffered while waiting to hear whether my offering would be accepted. And now, when the sun is undoubtedly setting on my long surgical career and you confer on me the high honour of the Lister Lectureship I confess to a feeling of satisfaction and pleasure that has not often been mine.

When I selected the subject "The Practice of Surgery in Canada" I did so because I suppose there is no one in this country who has had greater opportunities to observe it in all its phases or has had occasion to think about it more intently. I date back to the days when the Toronto General Hospital had only one operating room, when the Hospital for Sick Children had no operating room at all because the ladies who built it felt that they did not want the children abused, and to the time when major operations were done on the kitchen table without the benefit of a nurse. Dr. John Oille will recall the numerous occasions on which we tackled abdominal surgical emergencies in a sawmill camp with a lantern as our operating room light and a lumberjack as our anaesthetist.

The most hair-raising of these experiences occurred in a farmhouse near Oro Station where I had been called to operate for appendicitis. The patient was a healthy middle-aged Scottish woman who because of some perfectly justifiable

doubts about the beardless youth who was to operate on her, insisted that her minister, the Reverend Mr. Campbell, I think a cousin of Angus's, should remain in the room during the operation. Well, the usual gridiron incision soon demonstrated that this was no appendicitis but that it was some sort of a large dark-coloured cyst filling the whole right side of the iliac region without any inflammatory reaction whatever. I had not the faintest idea what it was but I had presence of mind enough to stand always in such a position that the Reverend Campbell could not get a clear view of what was going on. I then applied a rule that has often stood me in good stead ever since, that if I do not know how to do a great good, I should make sure of doing as little harm as possible, so I marsupialized it. I remember noting with satisfaction that as the trochar emptied the cyst there was no smell of urine. The patient was then returned to bed with a tube stitched to the cyst wall and skin. As you may well suppose the days that followed were laden with anxiety for me, for upon returning to Toronto I found that the diagnosis must have been ovarian cyst with twisted pedicle and that I should have removed it. However, by the exercise of masterly inactivity all went well and on the 10th day I had a call from the doctor to say that that morning the patient had strained a little and the cyst had turned inside out on to the abdominal wall and he had simply cut it off. She made an uninterrupted recovery.

The aftermath of this episode contains a moral. Years had gone by and the Barrie papers had copied the announcement in the *Globe* and in the *Mail and Empire* that I had been appointed Professor of Surgery and Surgeon-in-Chief of the General Hospital. Next day my mother received a call from the Reverend Mr. Campbell who came to congratulate her on the honour done to her son and to tell her how sure he had been, from what he had seen many years before in the kitchen at Oro Station, that her son was a great man.

* The Eighth Listerian Oration.

Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, in General Session, Toronto, June 23, 1948.

LIBRARY
BOSTON UNIVERSITY
SCHOOL OF MEDICINE

The rise of scientific surgery in Canada began in the last ten years of the last century. John Stewart of Halifax, the first of the Lister Lecturers in this Association had been Lister's house-surgeon at the time he transferred from Edinburgh to London. Grasett and Baldwin of Toronto also served as his house-surgeons. A little later young Canadian graduates began to drift to London and Edinburgh to attend clinics and to try the qualifying examinations. They ultimately returned to Canada and began the slow process of segregating off from general medicine in the teaching hospitals the departments of general surgery. Here in Toronto the leaders in this movement were Aikens, Cameron, Grasett, Peters and Primrose. I think Geo. Peters was the first Canadian to come back with the diploma of Fellowship in the Royal College of Surgeons of England. In Montreal the outstanding men were Bell, Shepherd and Armstrong, and throughout the rest of Canada there was a sprinkling.

When one compares the training that these men received with that of the young men now preparing for surgical careers, it seems to have been totally inadequate. One must remember, however, that at the turn of the century the practice of surgery was largely concerned with the treatment of fractures and other traumas, and of acute infections, and that the fields of abdominal and thoracic surgery and of orthopaedic surgery, neurosurgery and vascular surgery were practically unknown. A prolonged training, therefore, was unnecessary and indeed was impossible to obtain.

As the 20th century advanced two great changes occurred. First, a tremendous forward movement began in medical education, beginning in Germany and then moving into America. The opening of the Johns Hopkins Hospital and Medical School with the introduction of the full time professorships and the resident system marked the beginning of a movement which has gradually spread over the English-speaking world. The Rockefeller Report on Medical Education swept into the discard all the substandard schools, and the Foundation, both by advice and by financial assistance, which with the greatest of liberality was extended to Canada, led the schools of this continent to the position of leadership they now occupy. In this general advance surgery had its share.

The second great change occurred in the hospitals. Not only in the educational centres but in every city and town in the country hospitals began to be built and each was provided with much improved surgical equipment. It soon became possible to carry out all sorts of advanced surgical procedures at a distance from the medical centres associated with the schools. The combination, therefore, of the rapid increase in the number of medical conditions amenable to surgery and of the tremendous increase in hospital accommodation and equipment made the training of the surgeon and the surgical specialist one of the most urgent problems in medical education.

The first move in Canada was made in 1921 when Clarence L. Starr accepted the appointment of Professor of Surgery in Toronto on a full-time basis and made the beginnings of the Resident System in the General Hospital. Since then we have gradually built up a system involving the Toronto General, St. Michael's, the Toronto Western, and the Hospital for Sick Children, and more recently the hospitals of the Department of Veterans' Affairs, and the Weston Sanatorium, in which after the ordinary rotating internship the students are enrolled as candidates for the degree of Master of Surgery for periods varying from three to five years. In this course the candidates, acting as senior interns or what our American friends call assistant residents, receive a practical training which includes an extra six months of medicine, six months of pathology, a year of general surgery, and a year or more of the surgical specialties. For those candidates who seem to have an aptitude for academic life it includes also a year in one of the research laboratories, a year abroad, and a year as resident surgeon.

On the surface it might appear that the inauguration of such a program would be simple. I did not find it so, however, for it involved a complete change of attitude of the staff towards education. In the past it was the duty of the surgeons to do the surgery and to teach the simple fundamentals to the undergraduates. It was no part of their duty to train surgeons and few of them ever did. The interns, of whom there were only 12 in the General Hospital in my day, came for a year or so on rotating service and then drifted into practice. To change this it was necessary that

the attitude of the staff towards the interns should change, that they should no longer look on them as servants but as graduate students, and that they should be prepared to teach them to do the operations that they could do much more quickly and skilfully themselves. It takes some patience and some appreciation of the principles of pedagogy for a mature surgeon to stand on the opposite side of the operating table and assist a clumsy young tyro at his first difficult operations. The change has been accomplished, however, and now if any of you have occasion to visit these various hospitals you will find most of the operations being done by the resident staff under the guidance and supervision of their teachers. Only by such a system of apprenticeship can first class postgraduate teaching be done.

From time to time pressure has been brought to bear on the Faculty by the alumni that we should establish here a postgraduate school. It has been argued that if this were done courses could be given in the basic sciences and in surgery itself which would enable a practitioner in a short time to acquire a sufficient knowledge of the principles to let him practice as a specialist. This idea, however, is based on a lack of appreciation of the tremendous expansion of the surgical field which makes it impossible to master the principles without years of apprenticeship and of study. Further, it has failed to notice that the Colleges and Boards are requiring years of practical training in hospitals approved for such graduate training before the candidate is eligible for examination. These circumstances make short courses, except for refresher purposes, useless.

On the other hand these remarks must not be interpreted as meaning that this school has been opposed to the principle of postgraduate teaching. On the contrary we have been building up for twenty years a postgraduate school in surgery which now has 50 pupils and which is sending up eight or ten candidates a year for the Fellowship examinations. In these twenty years sixty young men and women have graduated from the course and are now scattered over the land and doing their share of its surgery. Two are Professors of Surgery in great schools, nine are Assistant Professors, five are Surgeons-in-chief of Toronto hospitals, two are in Vancouver and one in Halifax. The others are in practice from one end of the

country to the other. They are all members of a surgical club whose motto suggests mutual assistance and the service of our people by the advancement of our science and our art.

But sixty surgeons produced in twenty years in the face of the needs of our country are a mere drop in the bucket. I am glad to see that McGill and the University of Montreal have lately undertaken similar diploma courses and that London too has joined in the program. If the movement can be extended to all the medical schools I think we could look forward to a day when all the surgeons of our country would be adequately trained.

If those schools which have recently inaugurated these postgraduate courses, or are planning to do so soon, want any advice from me it would be that every effort be made to enlist the sympathetic support of the staff. To make a successful postgraduate school it is necessary for most of the surgical staff to undergo a rebirth. They must say farewell to the day when surgical reputations were built solely on knowledge and skill and accept a new standard of excellence which is based on the quality of the men and women they have trained. This, of course, means that the professor and at least some of his staff are on full-time or modified full-time basis and that appointments on teaching hospital staffs will be based not solely on skill and ability as a surgeon but also on enthusiasm and aptitude for teaching and research.

The question is often asked whether such an intensive program of postgraduate training may not overstock the country with surgeons? The answer is that for the next twenty-five years at least, there is not a chance of this. You must all be aware of the very general feeling that has swept over the whole of America that better medical services must be provided, particularly to those living far from the medical centres. This naturally includes better surgery. To bring this about requires, first of all, better qualified surgeons. To help this movement forward there have been established in the United States the American College of Surgeons and later the American Boards of Surgery and of the Surgical Specialties. In Canada we have established the Royal College of Physicians and Surgeons and their Committees on the certification of specialists. You will recall that when all these bodies were set up

a certain group of founders were selected from the staffs of the medical schools and the larger non-teaching hospitals and from those practitioners who had demonstrated proficiency in surgery and were actually doing the work. It has been said with some bitterness that many of us who were founders could not possibly pass the examinations now being set for the candidates for fellowship or certification. This is probably quite true but, on the other hand, we had the practice and there was nobody else to take care of it, at any rate until better men could be trained. The indications are clear, however, that with the establishment of the high standards of apprenticeship and of academic studies now required by the Colleges and Boards, and with the certainty that sooner or later licence to practice surgery will be granted only to those with these high qualifications, all our schools must be brought into action now if we are to turn out an adequate supply of trained men.

Great changes have taken place in the lives and the practices of surgeons and the surgical specialists since I was young. In those days most of the surgeons of Toronto were general practitioners and it was not until after the first war that the staffs of our hospitals were required to limit their work to their specialty. It was so obvious then, however, that the field of surgery had greatly widened and that much greater advances were imminent, that it was accepted the world over that he who would espouse Surgery for better or for worse must forsake all others and cleave unto her until death did them part. The amount of reading, travelling and studying that a modern surgeon must do to keep abreast of his constantly changing science is so great that it is quite impossible for him to give his mind to anything else.

Soon after the products of our attempt at mass production of surgeons began to come off the assembly line this problem of limitation of practice came up. I knew perfectly well that these young men could not keep abreast of modern surgery if they were cluttered up with other kinds of practice but my friends all over the country assured me that if a young man tried to limit himself to surgery only he would starve to death; that all the doctors in the towns did their own less difficult surgery and that if anything unusual came up they sent it to a consultant in the city rather than to a local prac-

titioner. Well, the first dozen or so were either absorbed by Toronto hospitals or joined established clinics. They all limited their practice to surgery only and they all did well. Then one went to a large town, informed the doctors of his training and qualifications, and made it known that he would limit his practice to surgery and would not be in competition with them in other types of work. Promptly he began to get referred work. First it was fractures, appendices, and varicose veins, then a gall bladder, then a fracture of the neck of the femur, then a couple of goitres, then a carcinoma of the stomach, and the last time I saw him he had successfully dealt with a sciatica by removing a disc. By the time he got the gastrectomy to do he was so out of practice in stomach work that he came back to Toronto and got Dr. Roscoe Graham to do one with him. These young men know that their Alma Mater is behind them and that when they need help they can get it.

So we were committed to the principle that after four or five years of postgraduate work, and after getting the diploma of Fellowship in one of the Royal Colleges and perhaps the M.S., which is an additional guarantee, we shall limit ourselves entirely to surgery. We feel that this plan will not only provide our country with the best service but that it will be acceptable to those practitioners who are not surgeons.

The success of such a plan as I have outlined must, of course, depend very largely on the approval and support of the profession at large. There is little room for doubt, however, that if qualifying standards are kept high and if the supply of properly trained men is sufficient the practitioners all over the country will welcome them (as, indeed, they have already done) and place in their hands those patients for the treatment of which they have been so specially trained.

In this relationship I must speak briefly of the pernicious practice of splitting fees. Some of these young men have told me that in some of the cities and towns where they have considered settling, fee-splitting is so universal that they did not think there would be a chance of getting a practice without it. My answer has invariably been that if they haven't the small amount of moral courage necessary to resist that sort of thing, they certainly have not the

very high level of courage that is necessary to do good surgery.

My own experience was interesting. Not long after I had set up in practice in Toronto and was wondering if I would ever be able to pay the rent one of my classmates came to me and said he would like to send me his surgery if I would agree to a kick back of 50% of the fee. To support his proposition he had with him a patient with a gall bladder full of beautiful stones. Fortunately for me I had thought out this problem long before and had made the decision which I have not since regretted. If I had succumbed to temptation that day I certainly would not be your honoured Lister Lecturer now.

This splitting of fees is a most iniquitous business for it leads to the reference of patients in other directions than to the most competent. Fortunately, however, it is on the wane, for the Royal and the American Colleges have set their faces steadily against it and are now refusing to approve hospitals for graduate training where members of the staff are known to be fee-splitters. This will mean that internship in such hospitals will not be accepted by the Colleges and Boards as part of the apprenticeship necessary before the candidates can present themselves for examination, and consequently application for internship will disappear.

If I read the signs of the times correctly, also, the rather universal acceptance of certain principles of socialism are bound to have their influence on practice. The dividing of England into medical districts with the necessary quota of specialists established in each is bound to have its effect here. Only the other day, one of our young graduates was appointed as thoracic surgeon to the district of East Anglia in England with headquarters in Cambridge. This sort of allocation of specialists to the places where they are needed, whether controlled by the profession or by the government will certainly end fee splitting.

I am afraid that if I dwell further on the subject of the education of the surgeon I will weary you and defeat the object I had in mind when I started this lecture. That object was to draw your attention to the tremendous improvement that is taking place in the practice of surgery and to enlist your support and encouragement for the young men and women who with much enterprise and courage and with much hard work and self sacrifice are facing the

new situations presented by the changing times. Four or five years of hard hospital work, with practically no remuneration, to be followed by preparation for and the passing of stiff examinations for fellowship and certification is something that deserves the approval and encouragement of us all. These young surgeons will not be in competition with their colleagues who are in general practice but will be available to them as consultants and as specialists when the necessity arises. Only by such combined effort on the part of all who practise the healing art can we give the service to our people that they must have.

I cannot refrain from speculating a little in regard to the future. If I were a young man again and not committed to academic life I would very seriously consider joining or organizing a clinic. Group practice offers so much both to the patient and to the surgeon that I feel sure it is here to stay. It in reality is the application to private practice of the system we use in the public wards of our teaching hospitals. This not only gives a full life to the staff but it provides without doubt the finest medicine and surgery for the patient.

Then, convinced as I am that our people in the towns and villages, on the farms and on the frontiers, have as much right to first class surgical care as those of us who dwell in cities, I feel sure that part at least of the plan being adopted in England has much to recommend it. You will recall that Great Britain is being divided into districts such as East Anglia mentioned above, each of which will have a medical centre where all modern scientific equipment and specialist consultation will be available. England, of course, is infinitely better adapted to this sort of thing because of its small size and its dense population. Yet with the judicious placing of such centres and with the use of the ambulance aeroplane I feel sure that the same system could be inaugurated here. While the idea of establishing hospitals in such centres and staffing them with internists, surgeons, and specialists may savour of the kind of regimentation that the profession on this continent dislikes, and while it would probably involve putting such men on a full-time basis, yet it would be a long step forward in providing adequate care for our people.

In this Lecture which is delivered once every third year before this Association we are

celebrating the life and works of one of the greatest men who ever lived. If you accept as a standard of greatness the contribution he made as a benefactor of his fellow man, then Lord Lister is the greatest of all. His studies made possible all the advances of modern surgery and the extension of its beneficent effect to millions and millions of people. But in order that his great discoveries and the advances that have been based on them may be available to all the people we must train more surgeons and we must provide them with the means of carrying out their work. This calls for a degree of co-operation between the public and organized medicine that does not yet exist, and it calls for the support and guidance of this Association.

Some may doubt the possibility of creating the Utopia I have described. When one recalls, however, the success with which it was done in our armies where by efficient organization and by an adequate supply of consultants and of well trained young surgeons our soldiers were given a quality of surgical care never before thought possible, then there is no reason in the world why we cannot do the same thing in civilian life. With careful planning and with the use of radio, the aeroplane and the judicious placing of our medical centres I can see the benefits of modern surgery being carried not only to our towns and to our rural settlements but also to the farthest outposts of our country, where many of the best of our young people live and are doing the things that make our country great.

Medical Arts Building.

POST-TRAUMATIC GRANULOMA OF THE BONY ORBIT SIMULATING TUMOUR*

G. Stuart Ramsey, M.D., H. Wyatt Laws, M.D.,
J. E. Pritchard, M.D. and Harold Elliott, M.D.

Montreal, Que.

TWO almost identical cases of cyst-like, expanding lesions of the bony orbit causing proptosis are presented. Each was originally thought to be a metastatic, malignant tumour, but postoperatively, on pathological examination, was found to be a chronic granuloma. To

show that the lesion is not peculiar to the bony orbit, these cases are augmented by a case of a similar lesion in a rib. A study of both textbooks and literature brings to light only two references which bear any resemblance to this condition in the skull.^{1, 2} W. E. Dandy,³ in his textbook, lists orbital tumours as follows:

Character of tumour	No.	%
Inflammatory mass	1	3.2
Pure fibroma	1	3.2
Pure osteoma	2	6.5
Osteomatous cyst	1	3.2
Spindle-cell sarcoma	1	3.2
Round-cell sarcoma	1	3.2
Schüller-Christian's disease (probable)	5	16.2
Dural meningiomas of nerve sheath (bilateral)	1	3.2
Dural tumours without hyperostosis of skull (by x-ray)	2	6.5
Sarcoma with tremendous hyperostosis of skull	1	3.2
Dural meningioma with hyperostosis of skull	9	29.1
Periosteal sarcoma	1	3.2
Carcinoma	1	3.2
Glioma	4	12.9

It will be noticed that post-traumatic granuloma is conspicuous by its absence.

CASE 1

This was a 57-year old white labourer. In 1919 he had been struck by a flying spike over the right supra-orbital margin; this resulted in a painless, permanent, slight swelling posterior to the lateral third of the right eyebrow. On November 5, 1943, he was admitted to the Montreal General Hospital having been struck by an automobile. In addition to minor injuries, the right supraorbital region had struck the pavement, causing a swelling involving the right orbit and the superior orbital margin; this was compressible at certain points and crepitus was obtained on pressure over the superior orbital margin. There was proptosis of the right eye with upward limitation of movement. Since the fundi and fields of vision were normal, and there was no pulsation or bruit heard over the orbital area, the proptosis was attributed to dislocation of the eyeball due to an extra- and intra-orbital tumour. Family and personal history, further physical examination, urinalysis, and blood Wassermann were negative. X-rays showed a comminuted fracture of the lateral and superior margin of the right orbital fossa with some lateral displacement of the fragments.

On November 24, a biopsy was made on tissue removed through an opening in the right outer frontal plate; the material was soft, cellular, and brownish-pink (see pathology report below). The tumour seemed to extend outside the orbit* and complete removal would have required a very radical attack. At the patient's request, he was discharged on December 3, to be followed in the Neurological Out-patient Department.

He went back to work and felt perfectly well until about June 10, 1944, when the tumour mass began to increase rapidly in size, and he experienced dizziness on bending over or on moving his head from side to side. On July 19, he was admitted to the Montreal Neurological Institute. Physical examination revealed a firm, irregular, reddish, swelling in the right frontal region above and lateral to the right orbit and encroaching on

* From the Departments of Ophthalmology, Pathology and Neurosurgery, Montreal General Hospital, McGill University.

* According to Dandy: "Byers (1901) and Hudson (1912) demonstrated by post mortem studies that 75 to 80% of all orbital tumours had intracranial extensions which subsequently caused death".

it (Figs. 1 and 2). This mass seemed to be fixed and continuous with the right frontal bone, and its anterior pole was soft. Ophthalmological examination showed the following: Vision: right = 6/20, left = 6/30; cycloplegic refraction, right + 2.00 sp. = 6/8, left + 3.00 sp. = 6/6; there was marked proptosis (exophthalmometer readings, right = 19 mm., left = 12 mm.); left hyperphoria of 5 prism diopters; he complained of diplopia but none was demonstrable at the time of examination; the fundi were normal except for some light pigment changes near the right macula; the eye itself was not considered to be involved. X-ray report; "the appearance is that of a long continued expanding lesion in the neighbourhood of the right orbit; a mucocele is the most probable diagnosis" (Figs. 3 and 4).

On July 28, 1944, Dr. Wilder Penfield performed a right supraorbital craniotomy and removed the orbital tumour. The tumour was approximately 3 cm. in diameter; it occupied the lateral 2/3rds of the right supraorbital ridge, the zygomatic process of the right frontal bone, and was pushing the eyeball downward and medially. The tumour was partly cystic, and these

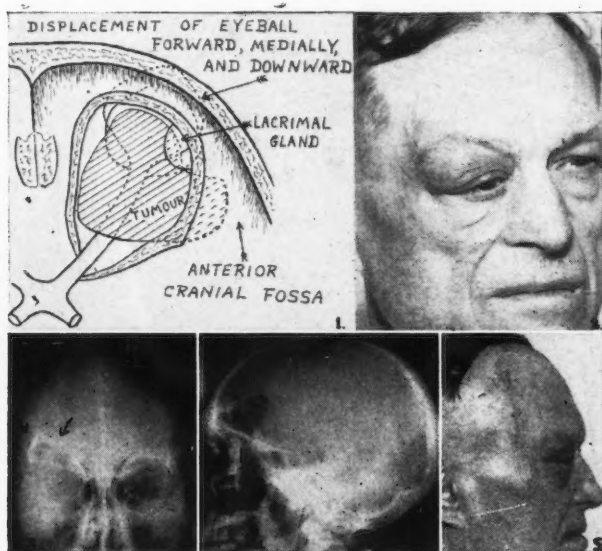


Fig. 1. (Case 1).—Superior aspect of right orbit redrawn by Dr. Laws from Dr. Penfield's operative sketch. Fig. 2. (Case 1).—Preoperatively. (Right eye). Figs. 3 and 4. (Case 1).—Antero-posterior and lateral views of expanding lesion. Fig. 5. (Case 1).—Postoperatively.

cysts contained yellowish, glistening, gelatinous material. It had caused rather marked thinning of the plates of the expanded bone. It consisted of soft, brownish material which was relatively avascular and which presented a fairly well-demarcated frontier. It was densely adherent to the lachrymal gland.

The postoperative course was uneventful (Fig. 5). This patient has not returned to the clinic despite several follow-up attempts to get him there, but as of August, 1947, three years after operation, he is known to be living and to be without any symptoms of recurrence.

Pathological report.—Biopsy of November 24, 1943. The sections consist of fragments of three types of tissue. One small fragment is composed of a periosteal type of fibrous tissue on one margin of which is incorporated a small fragment of "young" bone. Another small fragment consists of shattered, calcified bone with

the periosteum attached in places. The periosteum is actively cellular; the bone fragment is in part compact and in part trabeculated. The third and largest fragment consists of a mass of cellular connective tissue in which there is a good deal of blood pigment and innumerable, clear, elliptical slits representing dissolved-out crystals. About these slits is a well-marked foreign-body multinucleated giant cell formation. Incorporated in the denser connective tissue at the periphery are some small fragments of bone. Scattered throughout are small numbers of lymphocytes in the connective tissue. The appearance is that of a chronic granuloma due to crystalline foreign material which, in the presence of the abundance of blood pigment, could be interpreted as organization of an old hæmatoma (see Fig. 10).

Examination of sections of tissue removed at the Montreal Neurological Institute on July 28, 1944, shows tissue similar to that described in the granulomatous areas of the M.G.H. sections above; in addition there is, at its periphery, well-vascularized granulation tissue with fresh hæmorrhage and quite heavy infiltration with lymphocytes and a few polymorphonuclear leucocytes. In certain places in the granulation tissue there are many foam cells. In some fields, this granulation tissue merges with the foreign body type of granuloma, which consists of innumerable, closely-arranged elliptical slits separated by cellular, well-vascularized connective tissue which contains a little collagen, moderate numbers of foreign-body giant cells, and is infiltrated with lymphocytes and a few polymorphonuclear leucocytes. Comparing this M.N.I. section with the M.G.H. biopsy, taken six months previously, there is a more recent inflammatory reaction with active granulation tissue formation, less fibrous tissue, and more recent foreign-body granuloma. In this tissue there is hæmosiderin pigment and a good deal of fresh hæmorrhage; the latter may have been consequent to the operation (see Fig. 11).

Pathological diagnosis: post-traumatic granuloma in bone.

CASE 2

A white, 44-year old chauffeur, was struck over the left eye with a baseball bat without loss of consciousness in 1912. Following some temporary swelling, he had no apparent complaints. In 1934, he was held up by a thug who struck him on the left temporal region near the orbital margin with a "knuckle-duster". He lost consciousness for "a few seconds", and again there were no apparent, permanent sequelæ.

During the summer of 1946, he began to notice swelling and protrusion of the left eye, which would take place after driving or after seeing a movie. He complained of double vision on looking upwards, or upwards and outwards. This condition became progressively worse and during January, 1947, the left eye became permanently and progressively protruded.

On admission to the Montreal General Hospital on February 10, 1947, there was a palpable swelling in the upper outer corner of the left orbit which visibly displaced the eye downward (see Fig. 6); there was marked proptosis (exophthalmometer readings; right eye = 17.0 mm.; left eye = 23½ mm.) with almost absent upward rotation of the left eye. There was venous engorgement in the left fundus, but the fields of vision were essentially normal. No pulsation or bruit was heard over the orbital area; vision right = 6/9, left = 6/12. Apart from this, personal and family history, general physical examination, and laboratory tests including blood and cerebro-spinal fluid serology were essentially negative. Detailed x-rays, including a pneumogram, showed a concentric, expanding lesion with rarefaction of the left frontal bone. It extended from the frontal sinus on its

moved leaving the dura mater under the left frontal pole exposed to the orbital fat. The dead space was filled with fibrin foam and the wound closed (see Fig. 9).

The postoperative course was uneventful, and on March 8, he was discharged. At this time he noticed improvement in his diplopia. On April 14, he was readmitted for tantalum cranioplasty of the left fronto-orbital defect. Since then, he has had no subjective symptoms, and the mild ptosis following the first operation has disappeared.

Ophthalmological examination August 5, 1947: No diplopia. Esophoria 8Δ. Right hyperphoria 4Δ. Vision, right = 6/6-; with correction = 6/6; left = 6/6-; with correction = 6/6. No exophthalmos; complete comfort. He has returned to his job and to his usual normal activity.

Pathological report.—Specimens obtained at time of operation February 27. One group of sections consists of irregular masses of disintegrating blood clot, the majority of the red cells of which are laked. Throughout this clot, there are large numbers of elliptical crystal clefts together with numerous yellow-brown crystals, rhombic in shape, and a smaller number of fine, brown, pigment granules. Relatively few leucocytes are entangled in the clot, together with a few larger, rounded cells with small, central, pyknotic nuclei, and eosinophilic, sometimes-vacuolated cytoplasm. These resemble macrophages. Some such cells contain finely-granular, brown pigment within the cytoplasm. Included with the clot is a minute fragment of disintegrating, dead bone and an attached mass of dense fibrous tissue. There are several fragments of dense fibrous connective tissue in which there are elliptical crystal clefts, surrounded by a granulomatous reaction. This consists of fibroblasts, lymphocytes, and eosinophilic macrophages; some of the latter contain fine, granular, greenish-brown pigment. Similar pigment is seen in clusters of macrophages throughout the fibrous tissue, together with a light scattering of lymphocytes and an occasional polymorphonuclear (see Figs. 12 and 13). In unstained frozen sections, bright red crystalline material was seen. This is not evident in the paraffin section. These are probably some form of iron.

A second group of sections consists of a mass of moderately cellular and fibrous connective tissue, throughout which there are innumerable, elliptical clefts with pointed ends. Many of these spaces are lined and surrounded by enormous numbers of foreign-body-multinucleated giant cells. In some areas there are foci of swollen macrophages many of which contain finely granular greenish-brown pigment which is also abundantly scattered throughout the



Fig. 6. (Case 2).—Preoperatively. Figs. 7 and 8. (Case 2).—X-ray views of lesion. Fig. 9. (Case 2).—Postoperatively.

medial aspect, along the outer, superior orbital margin to the zygomatico-frontal suture, and backwards in the temporal bone involving the greater wing of the sphenoid (see Figs. 7 and 8). An electroencephalogram showed some slow wave activity in the left antero-lateral frontal region. Several pathological diagnoses were considered, among them cholesteatoma, Schüller-Christian's disease,⁴ mucocoele, hamangioma of the left frontal sinus,⁵ or some other neoplasm (see above table from Dandy).

On February 27, a craniotomy was performed, by Dr. Harold Elliott, through a transverse incision along the superior margin of the orbit. The surface of the frontal bone, from the supraorbital notch laterally into the temporal fossa, was bluish in colour and "eggshell" in thickness. The tumour had eroded through the bone into the temporal fossa, and brownish, amorphous-looking material escaped on breaking through the eggshell-like outer plate. The immediate frozen-section report was: "foreign-body reaction to a crystalline substance and blood pigments without evidence of neoplasm". All the affected bone (the floor of the anterior fossa, the superior orbital plate, the orbital margin including the fronto-zygomatic process, and part of the temporal bone) was removed. The upper orbital fascia was also re-

tissue. In addition there is an abundance of yellowish-brown round and oval pigment granules.

A third group of sections consists of an elongated strip of moderately cellular, and in part hyaline, connective tissue, in which there is a light scattering of lymphocytes, polymorphonuclears, and macrophages, with, at a few points, elliptical clefts bordered by foreign-body giant cells. Pigment, as described above, is also present. Along one margin and enclosed within the fibrous tissue are several narrow strips of bone which are atrophic and disintegrating. Along the surfaces there is blood clot. In frozen sections stained by Scharlach-R, abundant lipid droplets are present within large numbers of

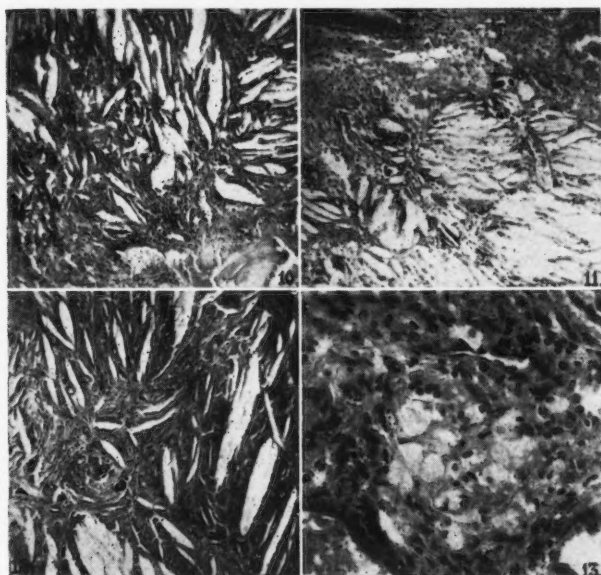


Fig. 10. (Case 1).—Shows the mass of granulation tissue with many clear elliptical slits about which there are foreign body multinucleated giant cells. At the lower margin of the section is a fragment of bone embedded in fibrous tissue. **Fig. 11.** (Case 1).—Shows chronic granulation tissue with innumerable elliptical slits and foreign body giant cells. Along the upper margin of the section is a considerable area of foam cells. **Fig. 12.** (Case 2).—Shows well organized fibrous tissue in which are many elliptical clear slits and a few multinucleated giant cells. **Fig. 13.** (Case 2).—Shows chronic granulomatous tissue with many foam cells.

macrophages. In addition some of the rhombic crystals retain the Scharlach-R.

There is no histological evidence of malignancy in these sections, nor of neoplasia for that matter. The lesion is a granulomatous one, with marked foreign-body giant cell reaction, fibrosis, and minimal inflammatory cellular exudate about lipid crystals. Pigments of several types are also present; these are probably of hæmo-

globin origin. In view of the abundance of hæmatogenous pigment, and the type of reaction, we are inclined to view this as a traumatic lesion, following the formation of a hæmatoma at some remote period.

Pathological diagnosis: post-traumatic chronic granuloma in bone.

CASE 3

This third case is presented because it shows an identical type of lesion in a rib. Although it might appear to spoil the continuity of the presentation, it is included since it adds to the understanding of this type of tissue reaction.

A white 53-year old male suffered multiple injuries in an automobile accident in 1916. He injured the left side of the chest but he was told that "no bones were broken". In 1918 he suffered war wounds involving the head, legs, and left elbow, but does not recall rib injuries at that time. On May 3, 1939, he fell down three flights of stairs and was admitted the same day to the Montreal General Hospital with pain in the left side of the chest suggesting a rib fracture. X-ray films showed a fracture line through an area of "cystic change" in the left tenth rib, and the possibility of a metastatic tumour was suggested. On May 20, an excision of part of the left tenth rib, from the midaxillary line to a point 2" from its neck, was carried out. An expanded portion of rib near its angle was found, and the periosteum was especially adherent in this region. This included the "cyst" as well as the recent fracture.

His personal history, family history, general physical examination, and laboratory tests including the blood Wassermann were non-contributory.

His subsequent clinical course was uneventful.

Pathological report.—A longitudinal section consists of 3½ cm. of rib. At one end, the diameter is that of a normal rib; the cortex on either side is intact and of normal thickness; the whole of the marrow cavity with the exception of a little bit of subcortical, trabeculated bone on one side is replaced by a granulomatous tissue. This consists of cellular fibrous tissue in which are incorporated many fat cells and some small cysts. Throughout, there is considerable lymphocytic infiltration and some minute fragments of preformed bone. Beneath the cortex of one side there is a broad band composed of large foam cells with small nuclei. The whole granulomatous area is permeated with thin-walled blood vessels. About the centre of the marrow space is a small focus of new bone formation (see Figs. 14 to 17).

As the section is traced along, the cortex becomes thin and the rib expanded. At one point the cortex is fractured and one fragment is depressed into the underlying granulation tissue. The central part of this area is composed of masses of homogeneous, eosinophilic, coagulum, in which may be seen many poorly-preserved, red blood cells and many elliptical slits repre-

senting dissolved-out crystals. Surrounding these areas there is fibrosing granulation tissue showing variable infiltration by lymphocytes and plasma cells, great numbers of foam cells, and many elliptical crystal slits, about which foreign-body giant cells are numerous. At several points there is new bone formation and some areas of recent hæmorrhage. In places the cortex shows lacunar absorption with widening of the Haversian canals filled with a loose vascular connective tissue. The overlying periosteum, where intact, is thickened and is quite cellular in its deeper part.

Pathological diagnosis: post-traumatic chronic granuloma in rib.

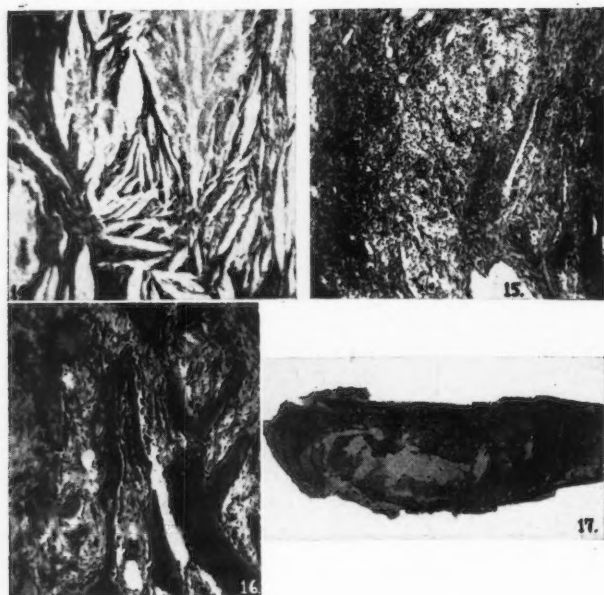


Fig. 14. (Case 3).—Shows chronic granulomatous tissue about elliptical slits, and in which there is fibrous tissue formation. **Fig. 15.** (Case 3).—Chronic (Case 3).—New bone formation at the margin of the granuloma. **Fig. 17.** (Case 3).—Longitudinal section of rib showing the expanding granuloma.

DISCUSSION

Radiologically, this condition can simulate any osteolytic lesion involving the frontal bone adjacent to the frontal sinus. Such possibilities are solitary myeloma, metastatic carcinoma, primary osteogenic tumours, mucocoele from the frontal sinus, other chronic granulomas, and traumatic bone rarefactions.^{1, 2}

The primary osteogenic tumours are rare in this age period and also infrequent in the skull. If we exclude these and the other above malignant conditions, we must consider the possibility of a mucocoele of the frontal sinus. This may be mistaken for a new growth or a chronic granu-

loma. It may grow and encroach upon the orbit. X-ray films show an area of decreased density surrounded by a zone of reactive bone with a history of slow growth. The sinus may show evidence of thickened mucous membrane. Any such defect in the bone may be due to a monostotic fibrous dysplasia of bone. The granulomas such as lipoid granuloma or eosinophilic granuloma are to be suspected. Syphilis, the great imitator, is always to be considered.

An osteolytic lesion of this type does not present features that permit of an exact etiological diagnosis.

Pathologically, the study of the two cases of tumour of the bony orbit shows identical features. The essential lesion is a chronic granuloma composed of granulation tissue about multiple elliptical crystal clefts and cholesterol crystals. The granulation tissue contains multinucleated giant cells and many fat-laden phagocytes and a variable degree of fibrosis. Different kinds of blood pigment can be identified in both lesions. The third case herein reported represents an identical type of lesion in a rib of a man who gave a history of multiple injuries similar to the two orbital cases. This identical reaction in the three cases is interpreted as a post-traumatic chronic granuloma due to degeneration of blood and fat. Associated bony fracture may be concerned in the mechanism of production. It is characteristic of these granulomas that the process is progressive over a long period of time and causes expansion and absorption of the bone and is sometimes accompanied by bone regeneration at the more organized fibrous periphery.

The type of reaction here reported is one which is familiar to the general pathologist. It is not different from the soft tissue granulomas often encountered following hæmorrhage into the tissues, injury to body fat, injection of hydrolyzable oils into the tissues, and where the cholesterol and fatty acid content of epithelial cysts is extravasated into the surrounding tissues.

In the pathological differential diagnosis, giant cell tumour can be ruled out on two main counts: firstly, giant cell tumour does not occur in membranous bones and the frontal bone is developed in membrane; secondly, histologically, there is no reason whatever to consider giant cell tumour. Bone cyst and enchondroma can be ruled out on the same grounds as for the giant

cell tumour. Other possible tumours such as enchondral fibroma, fibro-sarcoma, xanthoma, fibro-xanthoma, myoangioma, perineural fibroma, parasitic cyst, angioma, myeloma, cholesteatoma, mucocele, osteogenic sarcoma, and metastatic tumour can readily be ruled out by the histology of this lesion. It bears no resemblance, histologically, to fibrous dysplasia. Eosinophilic granuloma and Hand-Schüller-Christian's disease cannot be maintained as a diagnosis because there is not the reticulo-endothelial feature nor are there eosinophiles. No specific features of tuberculosis or syphilis can be demonstrated nor are there features of pyogenic granuloma. The one lesion that is most nearly simulated histologically is infarction in bone, but bone infarction, so far as we know, has been described only in the long bones where it never causes expansion.⁶ Moreover, infarction tends to calcify and ossify in time, producing a condensation of the bone as seen by the radiograph. The similarity of the histological appearance in post-traumatic granuloma and bone infarction can be accounted for by the antecedent hæmorrhage and interference with the circulation followed by necrosis of the blood and marrow content. Just recently, we observed an identical type of reaction in an eye in which there had been a known hæmorrhagic separation of the retina following an injury.

SUMMARY

Two cases of "post-traumatic granuloma of the bony orbit simulating tumour" are presented. These cases are augmented by a third case showing the identical pathological process in a rib.

From the radiological point of view, they are characterized by an osteolytic lesion. Pathologically, when a hæmatoma takes place in a bone, with or without actual fracture, the sterile elements of broken down blood may act as a foreign body which often lies dormant apparently for many years, and may become "activated" following another injury, or may cause a slow, steady reaction over several years. This "reaction" results in a destructive, expansile, tumour-like lesion in the radiograph which is actually a chronic granuloma with many foam cells and a foreign-body multinucleated giant cell formation around elliptical crystal clefts, cholesterol crystals, hæmosiderin, hæmatoidin, and other hæmoglobin pigments.

Surgically, they are very amenable to radical therapy.

We are indebted to: Dr. J. W. McKay, Radiology Department, Montreal General Hospital, for radiological advice. Dr. Wilder Penfield, Director of the Montreal Neurological Institute, for the report with drawings of the first operative case. Dr. D. L. Thomson, Prof. of Biochemistry, and Dean of Graduate Studies, McGill University, for his comments on the difficulty of assessing the morphology of the lipid crystals which are here called elliptical crystal clefts.

REFERENCES

1. ARENDT, J.: *Radiology*, 45: 608, 1945.
2. NICHOLAS, F. G. et al.: *Brit. J. Radiol.*, 21: 242, 1948.
3. DANDY, W. E.: *Surgery of the Brain*, p. 653, W. F. Prior Co. Inc.
4. CHIARI, H.: *d. allg. Path. Anat.*, 24: 396, 1931.
5. BYERS, W. G. M.: *Arch. Opth.*, 53: 280, 1924.
6. KAHLSTROM, P.: *Am. J. Path.*, 22: 947, 1946.

1496 Mountain St.

PROGRESS IN WAR MEDICINE SINCE 1939

L. C. Montgomery, O.B.E., M.C., V.D., M.D.,
F.R.C.P.[Lond.& C.], F.R.S.M.(Hon.)

Montreal, Que.

AS an introduction to discussing the various aspects of progress in war medicine since 1939 I should like to quote the two following comments:

"For the first time in the history of warfare there were more surgical than medical casualties. Strange as it may seem, in all past wars, disease has exacted a higher toll of manpower than has the trauma of conflict." (Col. William S. Middleton, M.C., U.S. Army, Chief Consultant in Medicine, E.T.C., U.S. Army.)

"The most important medical lesson learned in the past war, was that executive and combatant officers must be taught that the enforcement of hygienic measures, to preserve the health, morale and fighting efficiency of their troops, is as important as any other military duty." (Surgeon Vice-Admiral Sir Sheldon Dudley, K.C.B., F.R.S., Medical Director-General of the Royal Navy.)

BLOOD TRANSFUSION SERVICE

In view of the excellent work accomplished, I feel that some acknowledgment should be made of the organization planned and originated by Sir Lional Whitby, to keep the British and Canadian Armies supplied with sufficient blood and plasma. Six months before the war, the British policy was established of having a distinct transfusion service which could produce its own equipment, its own blood substitutes, and supplies of stored blood, and which could train and earmark officers and orderlies especially for this work. The object was first to put all the material and equipment needed, into the hands

of those who had to use it, without calling upon them to obtain supplies on the spot; and secondly to ensure that they knew how to use these materials to best advantage.

The headquarters of this service was established at Bristol, under the supervision of Sir Lionel Whitby, and it worked most efficiently during the whole war. Base depots were established within easy reach of the Canadian hospitals in Great Britain, and then when our troops moved to Italy and Northwestern Europe, there was always an adequate supply of blood and blood substitutes near at hand. These were flown out from the main depot at Bristol, to a base transfusion unit in each theatre of operation.

By April 1945, Sir Lionel reported that the B.L.A. in Europe had received some 97,000 pints of blood, 51,000 pints of fluid plasma, and 133,000 pints of glucose saline. During the war, to April 1945, 2,000 British and Canadian officers received training at Bristol, and also 200 American officers. The results of this service were remarkable, when taken in conjunction with the life-saving measures which can complete the good work begun by the intelligent applications of transfusions; namely, prompt, efficient surgery, and the control of sepsis with penicillin and sulfonamides. The recovery rate of the wounded has been estimated to be from 80 to 95%. What a change from the story in the South African War, and in fact, also from World War I!

TETANUS

Perhaps the most dramatic advance in preventive medicine was encountered in the protection given by tetanus toxoid. As you will recall, it was given to all Canadian and American soldiers at the same time as the T.A.B. vaccine. To my knowledge, no authentic case of tetanus developed in the Canadian Army overseas, and Col. Wm. Middleton, Chief Consultant in Medicine, European theatre of operations, U.S. Army, is the authority for the statement that only one instance of tetanus occurred in the American Army.

The Nazis afforded the perfect control. Only the Luftwaffe and certain paratroop elements received tetanus toxoid. Of the unprotected German prisoners of war, hundreds developed tetanus, and scores died in allied hospitals. As Col. Middleton remarks "A hideous commentary on Nazi psychology and medicine!"

TYPHOID FEVER

The efficacy of typhoid vaccination was proved beyond a doubt, when one recalls the decimation of troops in the South African War from typhoid fever, and then compares that tragedy with World War II, when less than 50 instances of the disease occurred in an army of over three millions. Of these, only 2 died. In our own Canadian troops in Italy, typhoid fever did occur. The cases which I saw were front line troops, and had obviously been exposed to massive doses of *B. typhosus*. So far as I know, none of these cases died.

Incidentally, it is also interesting to record that Dr. C. A. Peters of Montreal was one of the first Canadians to receive a dose of typhoid vaccine in the South African War. According to him, the inoculation was followed by a terrific systemic reaction!

DIARRHOEA AND DYSENTERY

In any campaign waged in tropical countries, the three main problems are malaria, diarrhoea, and dysentery. To exemplify what preventive medicine did in World War II, as regards diarrhoea and dysentery, one has only to compare the mortality tables for the Civil War with those of the recent conflict.

	Total cases	Deaths
Civil War	1,585,196	44,558
World War II	24,171	267

This was accomplished by proper sanitation, boiling and chlorination of water, and the use of sulphonamides. Of the latter, sulfaguandine, and succinyl sulfathiazole are the more preferred. The dose recommended is 3.5 gm. (52½ gr.) q. 8 hours until the stools are normal for four days.

GAS WARFARE

Although the threat was ever present, to my knowledge gas warfare was not indulged in by any country in the late conflict. Perhaps the only reason why the Germans did not use it, was that the Allies could return it to them three-fold! One of the most deadly gases known to be in the hands of the Germans was lewisite. As a result of this, the Allies worked feverishly to find an antidote. Thanks to the perseverance of Prof. R. A. Peters and his co-workers at Oxford, this was discovered, and the result was BAL (British anti-lewisite) known during the war as Ox 217 (2, 3 dimer-capto-propanol).

Fortunately, it was discovered that the above drug had a particular affinity for the arsenical radical in lewisite. As a result, experiments were made of its use in arsenical dermatitis, and we know now that it is a definite antidote in the following complications of arsenic therapy: (a) toxic encephalitis due to massive arsenotherapy; (b) agranulocytosis; (c) aplastic anaemia; (d) jaundice; (e) arsenical fever.

This drug is also beneficial in cases of mercurial poisoning. It is interesting to recall that it was Lieut.-Col. Sam Mirsky, of Ottawa, who was one of the first members of the R.C.A.M.C. to successfully treat a case of arsenical dermatitis with BAL. He may not recall it, but this incident took place at No. 8 Canadian General Hospital in April, 1944.

HEPATITIS

Of all the diseases which carried a high morbidity in the Allied armies, perhaps hepatitis was the most interesting. In Great Britain, the occurrence of jaundice in people following the injection of serum, was about the first event that began to arouse general interest. In 1937, I think it was, an outbreak of jaundice occurred in England in children inoculated with convalescent measles serum. A similar thing occurred in the winter of 1940-41, when soldiers were inoculated with convalescent mumps serum. However, it was not until a large number of cases of jaundice began to appear in American troops, who had been inoculated with yellow fever vaccine, that the army in Britain began to sit up and take notice. The Surgeon-General of the United States Army reported 28,585 instances of postvaccinal jaundice, with 62 deaths in the first six months of 1942. A check-up of the volunteers who contributed serum for the above vaccine showed at least one student to be suffering from infectious hepatitis.

The capitalization on the above experience has greatly advanced the knowledge of hepatic disorders. Also, substantial support in correlating the clinical and pathological findings has been derived from the studies done on punch biopsies of the liver by Dible, McMichael and Sherlock, at the British Medical Postgraduate School, Hammersmith. Much investigative work has also been done by Stokes and his co-workers in the United States, and the Medical Research Council Team in Great Britain.

It would now seem as if a virus etiology for the related, if not identical conditions, infective hepatitis, homologous serum jaundice, and post-arsphenamine hepatitis had been established. Neefe and Stokes have described what seems to have been a water-borne epidemic. Nevertheless it is probable that infection is usually transmitted by personal contact, dust, or droplet spread. The seasonal curve (October to March) is similar to that of droplet infection, and precludes transmission by flies. Although certain outbreaks have been associated with upper respiratory tract infections, the causal agent has not been effectively demonstrated in nasopharyngeal washings.

The incubation period is probably approximately one month, to be followed by the pre-icteric phase, which may last 5 to 10 days. Following this, the urine becomes dark, and the stools pale, then jaundice appears in the sclerotics and skin. Symptoms begin to improve when jaundice is fully developed. After 7 to 10 days the urine and stools regain their normal health 4 to 5 weeks after the onset of symptoms.

There may be wide variations from this typical course, both in severity and duration, especially in large epidemics. Although pre-icteric symptoms are sometimes inconspicuous, particularly in children, the majority of patients give a clear history of fever, or shivering, frontal or retro-orbital headaches, and pain in the limbs; high fever up to 103° F. may persist for several days. Anorexia and lassitude are almost invariable. Vomiting and upper abdominal pain or discomfort are common, and weight loss may be considerable. Urticaria, irritation of the skin, and erythematous rashes are occasionally encountered in the early stages. The liver is usually moderately enlarged and tender, and the spleen is palpable in 18 to 20% of the number of patients. Relapses occur in about 10% of cases and vary in degree.

Differential diagnosis.—In the pre-icteric stage, this includes other causes of obscure fever, such as influenza, meningitis, malaria, sand fly fever, and infectious mononucleosis. Abdominal pain may be so severe as to suggest appendicitis or perforated ulcer. Laboratory tests which may help, are bromsulphalein excretion, Hunter's test for bilirubinemia, and the differential leucocytic count, which at this

stage shows a granulopenia. It may be hard to distinguish between a jaundice due to hepatitis and that which is part and parcel of an extrahepatic obstructive jaundice. The diagnosis of Weil's disease should be considered if purpuric spots are found, or if the blood picture shows a leucocytosis.

Laboratory findings.—In addition to other liver function tests, the serum bilirubin curve gives the most valuable information in regard to progress. It may be rising or falling, or may indicate the occurrence of a relapse, while clinical jaundice is showing little change.

Progress.—Complete recovery is the rule. Yellow atrophy develops in about 1 in 15,000 cases. Cirrhosis as a sequela is probably very rare.

HOMOLOGOUS SERUM JAUNDICE

It is now well recognized that the jaundice which follows plasma transfusions, or inoculation with measles convalescent serum, or with yellow fever vaccine is due to an infective agent present in human serum. The incubation period is about 100 days. Clinically and histologically, this type of jaundice is indistinguishable from infective hepatitis, but does not appear to be naturally infectious and the one disease does not confer immunity to the other.

Post-arsphenamine jaundice.—Jaundice following arsenotherapy appears to be of the same type as homologous serum jaundice, and is transmitted by means of syringes contaminated with blood from infected cases. This type of hepatitis tends to be more severe and more prolonged than the other forms.

Treatment.—Rest in bed until urine is bile free and liver enlargement has subsided. High protein, high COH diet. A fat free diet is not necessary. Therapy with amino acids, methionine and cysteine is of uncertain value. Human gamma globulin lessens the incidence of epidemic hepatitis. Brigadier John Palmer is the authority for stating that among the Canadian troops in Italy the average period of disability was 50 days. This period included hospital stay and convalescent depot until the man was fit for full duty.

According to statistical data kindly supplied by the Department of National Defence, the total number of cases of hepatitis occurring in the army from 1939 to September 1946, was 1,388. The number of deaths, 9.

RESPIRATORY TRACT INFECTIONS

1. *Influenza.*—So far as I know, no proved case of influenza due to virus A or B occurred in any of our Canadian hospitals overseas. However, supplies of specific vaccine were on hand to deal with any outbreak which might have appeared. An outbreak did occur in the American forces, and in the civilian population in November and December, 1943. The mortality was in old people rather than in the young.

2. *Lobar pneumonia.*—The incidence of true lobar pneumonia, due to a pneumococcus, was not as frequent in Canadian troops overseas as we had been accustomed to see it in our hospitals at home, considering the same age group. In one month, only 22 cases were discharged from a total of 24 hospitals.

3. *Primary atypical pneumonia.*—This type of pulmonary infection was of considerable interest to all of us, and proved to be the most common form of pneumonia that we experienced during our stay overseas. There is no need of my going into a detailed description of the disease, because there has been a great deal written about it in recent medical literature. I can only emphasize that in our experience it was an acute infection which usually resembled clinical influenza in its onset, and in which physical examination proved unsatisfactory, as far as actually knowing what was taking place in the lung parenchyma.

MALARIA

During the past campaign, malaria was not the scourge it was feared it might be, and this was because it was realized that the control of the disease was a military rather than a medical problem. It was a job for the C/O and officers of a unit to see that anti-malaria discipline was carried out. The medical officer had to ensure that the units were properly instructed as to how the necessary measures were to be carried out.

I think it has been proved that 0.1 gm. of atabrin daily, while it will not prevent a soldier from contracting malaria, will at least keep it suppressed and allow the man to carry on efficiently. The above dosage certainly will not cure the disease. This was shown by the problem that arose in regard to the troops brought back to Great Britain for the invasion of Europe. A great many cases of relapsing benign tertiary malaria occurred, and this condition became a

major factor in the attrition of man power. With the faithful use of atebirin daily, this situation was overcome, and the drainage of fighting men stopped.

The total number of cases of malaria occurring in the Canadian Army, 1939 to 1946, was 6,349. There were no deaths from the disease.

SYPHILIS

The greatest advance made in the treatment of syphilis was the instituting of massive arsenotherapy, which was later followed by penicillin. At first, the 6-day course was initiated, and 1,300 mgm. of mapharsen were administered intravenously: 726 cases were treated to completion, and there were 4 deaths. It was then decided to conform to the type of treatment used in the American forces, and the 20-day treatment was instituted; 1,200 to 1,600 mgm. of mapharsen were given, and also 1.2 gm. of bismuth salicylate. Up until January, 1944, 487 cases had been treated, with no deaths.

Later in 1944, penicillin therapy was instituted. To quote Col. Middleton:

"The final test of time has not been applied, but 98.6% of syphilitic soldiers treated with penicillin (2,400,000 units, 60 intramuscular injections of 40,000 units each in 7½ days) in the primary sero-negative stage were negative at the end of six months. The results in secondary and late syphilis were much less spectacular, and as we now know the quality has been raised to 4,000,000 units and combined with injections of bismuth."

To anyone who had to be responsible for seeing that the soldier's venereal disease card (M.F.I. 1247 S) was kept up to date, this institution of massive therapy was a godsend, and certainly marked a step forward in the care of the luetic soldier.

TUBERCULOSIS

With a large number of the Canadian soldiers coming from Western Canada, where the incidence of tuberculosis is relatively low, and where it is known that a considerable proportion of the young adult population has a negative tuberculin reaction, we were rather anxious as to what would happen when these same people were exposed to a considerable risk from infection. It will be recalled that beginning in 1939, a routine x-ray of the chest was taken of all recruits entering the Canadian Army. By this method, about 1% of the applicants were found to have pulmonary tuberculosis, and were rejected.

Statements also appeared from time to time purporting to show that tuberculosis was on the increase in Great Britain. Dr. Wingfield in an address at the Royal Society of Medicine in 1942 stated that the morbidity of tuberculosis in Britain was reckoned at 0.7% of the population—350,000 cases, and that actively infectious cases amounted to 250,000. It was also estimated that there were 10 active cases for every death from tuberculosis in a community, and that there were 19 cases of all kinds of tuberculosis for every death. Wing-Commander Trail, in his Varrier-Jones Memorial Lectures for 1942, showed that out of 30,130 young airmen examined by mass radiography, 0.22% had active pulmonary lesions, and 0.36% had inactive lesions. All these people had been passed as physically fit on routine physical examination. He estimated that 3 per 1,000 supposedly healthy young adults in Great Britain had active tuberculosis, 15,000 in all.

With that background, it may be interesting to know how the Canadians fared, especially the troops overseas. This in view of the fact that reports appeared during the war, in the *British Medical Journal*, stating that 20% of the milk supply of one provincial town contained acid fast bacilli, and that 40% of the dairy cattle in England and Wales were affected by tuberculosis. The total number of cases of all types of tuberculosis which occurred amongst Canadians overseas between 1939 and 1946 was 1,009. The deaths amounted to 19, or 1.9%. The incidence of tuberculosis of all types in the Canadian active army at home and overseas was, I understand, approximately 0.08%. The lessons learned were: (a) The absolute necessity of x-raying all recruits. (b) The necessity of examining and x-raying the contacts of all cases developing tuberculosis. (c) The rapidity with which the disease developed in apparently healthy young men. We were shocked at finding evidence of extensive pulmonary disease in men whose history did not date back more than three months. (d) The consideration of giving BCG vaccine to all recruits.

MENINGOCOCCÆMIA

The story of cerebrospinal meningitis and meningococccæmia in World War II was quite a different one from that in World War I. In the latter, the mortality was 38%. In the European theatre of operations the figure fell

from 5.3% in 1942 to 2.8% in 1944. This remarkable state of affairs was almost entirely due to the diagnostic awareness of the medical officers and the advent of the sulfa drugs and later, penicillin. The prophylactic use of sulfadiazine in this type of infection was equally spectacular to its therapeutic value. Amounts as small as 2 gm. a day, cleared the upper respiratory passages of meningococci. A total of 7 gm. in 3 days was all that was usually required. Antisera played no material rôle in the treatment of meningococcal infections.

The total number of cases occurring in the Canadian Army overseas between 1939-46 was 76, with a total mortality of 9; in other words, a mortality of 12%.

PSYCHIATRY

The guidance of all matters psychiatric in the Canadian Army overseas was, as you are aware, in the able hands of Col. F. H. Van Nostrand, O.B.E., V.D. and I am indebted to him for what I have to say on this subject.

There has probably been more muddled thinking and talking in connection with psychiatry than with any other branch of medicine. On both sides of the Atlantic there has been a tendency for psychiatry to dwell in a very rarefied atmosphere, having a language all its own, only interpreted to the general practitioner by the high priests of the cult. Even the nomenclature of psychiatric disease has no uniformity, and many of the terms would have no precise meaning except to the persons using them. This ultra-specialization of psychiatry may have been a good thing, but it was a definite handicap in setting up a rational psychiatric service in the army. Col. Van Nostrand attempted to anchor psychiatry firmly to medicine and surgery.

Between 5 to 10% of the routine admissions to general hospitals were psychiatric disabilities, although the admitting diagnosis was usually a medical or surgical one, such as low back pains, dyspepsia, etc.

It was also found most advantageous to have a trained psychiatrist at divisional level, but it was impossible to expect a high percentage of psychiatric casualties to return to combat levels. In 80% of these, there was definite evidence of constitutional predisposition and the stresses of service were only precipitating factors.

Col. Van Nostrand thinks that no discussion of lessons gained in this war is complete without some mention of psychiatry in relation to personnel selection. He contends that personnel selection was not something brought forward for the first time in this war. Ghengis Khan, early in the 13th century employed this method. Those of his following who were by temperament unsuited to fight were detailed to tend the flocks and herds, move the caravans, etc., and really formed the service corps of his army. He also employed many skilled tradesmen who did not bear arms.

The Canadian neuropsychiatrists who served overseas do not believe that any of the tests or batteries of tests currently in use to test recruits, accurately measure stability or the ability of a man to carry his anxieties without breakdown. They therefore think that rejection at the point of intake should not be too rigid, but that weeding out during training should be more ruthless, and re-allocation because of proved unfitness should be more widely used.

Col. Van Nostrand states that it is conceivable that by early teaching, propaganda, blood-and-guts military training, and ruthless weeding out of the unsuccessful, the British Commonwealth of Nations and the United States of America could produce an immense fighting force which would win its wars with very few psychiatric casualties. If this should happen, he believes that we shall find the results hateful, and the ultimate disadvantages will far outweigh the wartime advantages.

CONCLUSION

As one reviews the medical progress made during the recent conflict one is struck by the tempo of its evolution. On an impartial analysis it becomes obvious that much of this has resulted from a speeding-up of scientific developments. Most of the basic facts and discoveries antedated the war. Their rapid fruition, to quote Col. Middleton, was, in most instances, the result of perfect team work. It is up to us to try and carry this idea of co-operation and team work into civilian life; to think internationally, and not parochially, and to remember that "There never was a good war nor a bad peace".

1414 Drummond St.

RECURRING SYNCOPE IN PATIENTS OVER 45 YEARS OF AGE

Charles Hunter, M.D.

Winnipeg, Man.

THIS paper is based on the records of 12 private patients, with ages ranging from 46 to 78 years, averaging 56; 7 were white collar workers, 3 workmen and 2 housewives. Their only complaint was of recurring, sudden spells of unconsciousness. Their history and their physical examination gave no clue to the origin of the syncopal attacks. All were active physically and were not short of breath; there was no particular rise in blood pressure or evidence of arteriosclerosis disproportionate to their ages in the peripheral or retinal arteries; no valvular or myocardial condition seemed responsible, even in the case of the only 2 patients who showed evidence of organic heart disease. The attacks were not fatal, usually not even serious. Six had no definite warning; a sudden weakness or dizziness or a curious epigastric sensation with nausea heralded by a second or two the onset in the others; 2 repeatedly sustained minor bruises, and one, falling from his veranda steps, broke his collar bone—very trifling mishaps considering the many dozens of syncopal attacks I have on record.

The loss of consciousness was complete, lasting for periods from only a few seconds to 10 minutes or thereabouts, generally apparently less than a couple of minutes, though one had to depend here mainly on the patient's or his friends' account. Within a minute or two the patient was usually himself, though sometimes upset and worried; vomiting occurred occasionally just at the end of an attack in 3 cases. Involuntary micturition, biting of the tongue and convulsive movements were never noted.

I witnessed 3 syncopal attacks, which occurred without warning, 2 brief, like petit mal seizures, with slow, regular and smallish pulse, the third complicated by a blow on the head in falling, with very slow pulse and respiration, prolonged unconsciousness and a passing amnesia for time and place on coming to.

Sudden movements of the head and neck, as in abruptly looking up, turning the head

sharply to one side or bending quickly seemed definitely in 3 cases to precipitate some of the attacks; tight collars were worn by 2 patients but no improvement occurred on correction of this habit. In only 4 of the 12 patients did attacks occur in the open air and even in these, the faints generally occurred in the house, occasionally in the office and only exceptionally in bed. None of the 3 workmen had attacks at their job.

Most of the patients were under observation for long periods (the main excuse for publishing so small a group); 4 were kept track of for over 20 years, 2 for 12 years and 3 others for 5 years, after the onset of syncopal seizures. Two patients have been very closely followed over many years. No deaths have occurred in this group, so far as I know, in syncope. In none of the cases was alcohol a factor. It would have been easy to increase the number of cases by inclusion of numerous patients over 45 suffering from recurring faint, dizzy attacks, short of actual unconsciousness, but the purely subjective nature of such spells renders the differential diagnosis much more difficult.

CASE 1

In 1905, on 5 or 6 occasions, I was called hurriedly next door to see a business man of 64, who had, without warning, attacks of syncope while standing or walking about his office. Seen within 2 to 3 minutes, he was pale but already recovering consciousness and was quite himself almost immediately. The cardiograph and the sphygmomanometer were alike unknown in Winnipeg at that date but ordinary physical examination was quite negative; he was not in the least short of breath. After some months, the syncopal attacks ceased without treatment; he remained in good health for many years, dying in 1928 of "myocarditis and arteriosclerosis", aged 88.

CASE 2

In 1908, an accountant, aged 49, without warning dropped unconscious in his office for a moment, vomiting as he came to. Eighteen months later, when I saw him for the first time, he had a similar attack in the evening. Physical examination all round was negative. Blood pressure 145 mm. Six months later, a third syncopal attack without warning or obvious exciting cause. In 1916, a similar experience; his last attack of unconsciousness occurred in 1922. All occurred at home or in the office; his mental and physical efficiency was unimpaired. He died in 1932 at the age of 73 of "cerebral hæmorrhage".

CASE 3

Another business man, aged 46, had a number of syncopal attacks, following by some months an obscure illness, possibly encephalitis lethargica, in 1919; I found, in 1922, no explanation for the attacks. His heart responded to exercise normally. Blood pressure 140/95. In the next 10 years, he had, to my knowledge, some 3 sudden attacks of unconsciousness, one lasting 20 minutes. He is still alive and active.

CASE 4

Since 1936, I have seen on very many occasions a white collar worker, now aged 71. An active though not powerfully built man, he enjoyed excellent health till 1936, when sudden syncopal attacks occurred, at first infrequently but soon several times a day, so that for some weeks, he had to remain at home. Thorough physical examination was quite negative, the cardiovascular system being quite normal for his years; cardiogram normal; Wassermann negative; fundi normal; hypoglycaemia was considered but after investigation ruled out. Pressure over the left carotid sinus abruptly slowed the heart markedly and lowered the blood pressure during the first half of the 25 second test but did not induce syncope. Pressure over the right sinus produced no effect.

A month's rest at home, with a subsequent holiday at the Coast, aided possibly by mebaral, 3 grains twice a day, was followed by complete disappearance of all attacks, for almost 10 years, during which he survived with ease an acute peptic ulcer with haemorrhage and a bronchopneumonic attack. In 1946, without obvious reason, he had a recurrence. Though he never stopped work, he had about a dozen attacks that year, which, however, disappeared, coincident with the use of dilantin, 1½ grains three times a day. This drug has been continued and in the last 6 months, he has had only 2 quite minor faints. General physical examination has remained negative; he looks no older than his years; an encephalogram was normal and the other tests, including the carotid sinus pressure test, remain as before.

I saw 2 of the attacks. In one, while playing bridge he suddenly lost consciousness for about half a minute, face pale and expressionless, pulse slow, regular and small, the cigar drooped but did not fall; he resumed play in a moment with his usual judgment. In the other attack, he dropped without warning while climbing stairs and bumped his head against a wooden step: he was unconscious for 3 or 4 minutes, quite pale with very slow pulse and respiration, dazed and sleepy for half an hour and then himself, save for a passing amnesia of time and place.

CASE 5

In 1936, a mechanic of 55 had some 6 syncopal attacks in the preceding 6 months, all while working around the house, never at work; 2 ended in vomiting and were followed by passing dizziness. Slight cardiac enlargement with associated aortic regurgitation; blood pressure 170/90; Wassermann negative. Had been steadily at work without pain or shortness of breath. I felt that the aortic regurgitation had nothing to do with the attacks and reassured him. In April, 1948, his physician writes: "his attacks of faintness passed off in a few weeks after he saw you and have not returned. He has been in good health ever since; is now retired."

CASE 6

A mechanic of 52 was seen in 1941. Six years previously, he had fallen from a scaffold, fracturing the sternum and, it was found later, also the 12th dorsal vertebra. Soon after, he claimed syncopal attacks began and continued at irregular intervals for the 6 years. All the attacks occurred in or around his house, never at work; he never was off work on their account and, in fact, did not report their occurrence till he had a syncopal attack on his veranda steps and fell, breaking his collar bone. The previous attacks had been preceded by a sudden feeling of weakness and of objects going black. Physical examination all round negative. Blood pressure 145/95. Heart and arteries normal.

CASE 7

In 1940, a businessman, aged 52, came to me for a general check-up, which was satisfactory. In 1943, he had his first syncopal attack while making a sudden

springing movement. His heart seemed normal, his blood pressure was 135/90. He was an active man and not short of breath but a cardiogram showed left bundle branch block with prolonged PR interval. An x-ray of the heart was normal, the great vessels' shadow broadened and a Wassermann was negative. Carotid sinus pressure slowed the heart and made the pulse smaller but did not induce syncope. He took life more easily and relaxed better but was given no medicine. Twelve, and again 18 months later, no change in the cardiogram was noted and he felt well, taking average exercise for his years. In 1945, he had 2 sudden faint attacks which passed off when he sat down and later, having recurring syncope, he was examined by another medical man who sent him to the Neurological Institute in Montreal where, in 1946, first one carotid sinus was denervated and then the other, after an encephalogram, x-ray of the skull, sugar tolerance test, etc., had been negative; in spite of mebaral, ½ grain twice a day, attacks recurred within 5 weeks and more than a dozen within a year of the operation. I have seen him repeatedly since the operation. The attacks seem frequently to be associated with sudden movements of his head and neck and possibly with tight collars; syncope occurred once in the barber's chair when being shaved.

It is worthy of note that the left bundle branch block and prolonged PR interval have remained unchanged for 5 years, unaccompanied by any clinical evidence of heart disease, in a man now aged 60, who has no particular shortness of breath on exertion.

CASE 8

A business man of 78 was examined by me in 1944. He had had 5 or 6 syncopal attacks in the previous 2½ years, preceded by a curious numbness from the knees up. I found nothing to account for these attacks. Heart normal, blood pressure 150/85; cardiogram normal. He was given a tonic and advised to go slow. In 1947, his doctor reported "no recurrence of syncope, still working in store every day and very fit".

CASE 9

In 1941, I saw a housewife of 57. Twenty-three years previously for 3 or 4 years she had fallen unconscious without warning when standing or walking about the house; such attacks came half a dozen times a year, unconnected with menstruation and without obvious explanation. They let up entirely for 15 years, recurring in 1937, 4 years before I saw her. They still came without warning and still only in the house while standing or walking about. The unconsciousness lasted only a minute or two, leaving her fit apart from a passing feeling of weakness and, occasionally, minor bruises. She was a powerfully built woman with clinically normal heart and blood pressure. Fluoroscopic examination of the chest normal and Wassermann negative; the cardiogram suggested some myocardial damage. In April, 1948, her doctor reported: "the syncopal attacks occur without warning but with lesser frequency in the last 7 years—possibly 3 or 4 times a year".

CASE 10

In 1930, I saw a housewife of 52 who had never been ill. In the previous 3 weeks she had had a number of attacks, without associated vertigo, of sudden momentary unconsciousness, coming only in bed when she made a sudden movement of the head. My general examination was quite negative all round.

CASE 11

A male teacher, aged 54, had 2 syncopal attacks in the previous 24 hours without obvious explanation. Physical examination was negative: heart and blood pressure normal. He was still active 8 years later.

CASE 12

Recently a storekeeper of 60 was seen who had had some 6 syncopal attacks in the last 18 months, all pre-

ceded by an uncomfortable feeling rising from the epigastrium, giving him sufficient time to sit down. Unconsciousness for a minute; nausea or vomiting on coming to; felt all right in 5 or 10 minutes. No explanation for the attacks, which all occurred indoors. Physical examination was quite negative. Blood pressure 130/85. Heart responded normally to exercise. Pressure over the carotid sinus did not affect his pulse rate or blood pressure and did not cause any disturbance of consciousness.

Diagnosis.—With *recurring* syncopal attacks the diagnosis becomes narrowed. It is remarkable how seldom recurring syncope is due to organic heart disease, though in the literature, aortic regurgitation and, more recently, aortic stenosis are sometimes incriminated. Coronary thrombosis can be excluded by the absence of pain or associated breathlessness in spite of repeated faints; heart block by the history, repeated examination of the heart and by the cardiogram; petit mal by the onset after 45 and by the absence of involuntary micturition or biting of the tongue.

Vasovagal syncope is closely allied but occurs chiefly, though not solely, in young individuals when standing or sitting. The attacks, too, usually are obviously caused by overheated or crowded rooms, emotional stress, disturbing sights or news in individuals often in poor physical condition. The vasovagal syncopal attacks may in themselves be indistinguishable from those under consideration: usually warning in the shape of giddiness, dimness of vision, nausea, yawning, then complete unconsciousness with dilated pupils, heart slowing to 40 or 50 and blood pressure progressively falling; the faint lasts perhaps 2 to 10 minutes, leaving the patient limp, weak and perspiring. Even in older individuals, such vasovagal attacks do exceptionally occur under similar exciting causes.

Hypoglycæmia had to be specially considered on several occasions and sugar tolerance tests were performed on 2 patients. Involvement of the labyrinth or its paths was excluded by the absence of ear trouble and of true vertigo with rotation of objects.

Prognosis.—The prognosis is obviously excellent, so far as life is concerned. Physicians are inclined to be too pessimistic in their outlook on such cases. Frequently, the attacks are few and far between; sometimes they keep recurring for some months and then disappear as mysteriously as they came. There seems even in severe cases to be a natural tendency for the syncopal attacks to let up and even to

disappear, a point to be remembered in assessing the influence of treatment, whether medical or surgical. Only 2 of my patients have been seriously and then only temporarily disabled by the seizures.

Treatment.—The patient, whose confidence has been rudely shaken by his "heart attacks", can be reassured and encouraged to carry on. No special drug treatment is indicated if the attacks are infrequent; nothing tight should be worn around the neck; obvious infractions of a sensible mode of life—overwork, worry, excessive smoking—should be pointed out, though in my own cases no outstanding indiscretions were noted. When the attacks occur more frequently, the patient should be warned against turning his head quickly, looking up or stooping suddenly. In 2 of my cases, the faints were controlled or disappeared coincident with the use of dilantin, a grain and a half three times a day. In very frequently recurring seizures, Harry L. Smith, of the Mayo Clinic, recommends phenobarbital, a grain and a half times a day for 7 to 14 days, with diminishing doses thereafter.

Operative procedures which in recent years have been advocated in selected cases of recurring syncope, unrelieved by medical treatment, involve a consideration of the carotid sinus. The carotid sinus is the bulbous dilatation of the internal carotid artery just as it leaves the common carotid; it is readily palpated in most people just below the lower jaw, about the level of the upper edge of the thyroid cartilage. It is richly endowed with a network of nerve endings which transmit impulses, mainly by the nerve of Hering through the glossopharyngeal nerve but also by other fibres, to the vagus and vasomotor nuclei in the medulla. The sinus helps to regulate the rate of the heart, the height of the blood pressure and also to maintain an adequate circulation in the brain.

In an uncertain percentage of normal individuals, firm pressure with the finger on one carotid sinus against the spine for 25 seconds induces very definite slowing of the heart, a fall in systolic and diastolic blood pressure, or both; such changes occur more frequently in older persons and especially if hypertension or marked arteriosclerosis be present; men exhibit this hypersensitive carotid sinus reflex, as it is called, more readily than women. Now

many, though by no means all, patients with recurring syncope have a hypersensitive carotid sinus (sometimes only on one side), pressure on which reproduces all the features of the spontaneous attack, a reaction abolished by infiltration of the adventitia of the sinus with procaine. Hence, denervation of the affected sinus or sometimes section of the glossopharyngeal nerve has been performed with varying success. But the carotid sinus is not the only, though it is the most important, sensory receptor reflexly controlling the heart rate and the blood pressure; such reflex stimulation of the vagus nerve can also originate, *e.g.*, from a diverticulum of the lower œsophagus, from an inflamed pharynx and from the bronchi. This fact may partially explain why operation, even in patients whose spontaneous attacks can be reproduced by digital pressure over the sinus, may fail to prevent recurrence.

A recent report from the Mayo Clinic may be summarized: 85 patients with "carotid sinus syncope": ratio of males to females 5 to 1; average age 56 years; only in 21, was operation—a complete denervation of the sinus—performed with "not too satisfactory results".

Only in 3 of my recent cases was the carotid sinus test applied. In one with no result, in the other 2, with slowing of the heart and lowering of the blood pressure. Obviously the test should be performed with cardiograph and blood pressure apparatus in position, in order to get scientific results.

SUMMARY

Ten men and 2 women, of an average age of 56, complained of recurring syncope. Followed over many years, they showed no special indications of cardiovascular disease or of high blood pressure; such syncope is not dangerous, tends usually to disappear and is very seldom disabling. Exceptionally, denervation of a hypersensitive carotid sinus may be tried.

513 Medical Arts Bldg.

Nor yet did he know that ideas, no less than the living beings in whose mind they arise, must be begotten by parents not very unlike themselves, the most original still differing but slightly from the parents that have given rise to them. . . . He thought that ideas came into clever people's heads by a kind of spontaneous germination, without parentage in the thought of others or the course of observation.—*The Way of All Flesh*; Samuel Butler.

HYSTEROSALPINGOGRAPHY*

Raymond Simard, M.D. and
Georges Fortier, M.D.

Montreal, Que.

AMONG the varied methods at our disposal for diagnosis in gynæcological morbid conditions, a very precious and at times indispensable aid is the use of uterosalpingography. The procedure is simple, innocuous, can be carried out on the ambulatory patient, and is remarkable for the clarity of the information it can give. It consists essentially in the visualization, by the use of a contrast medium, of the cervical canal, the cavity of the uterus and the lumen of the fallopian tubes as far as they are patent.

Its clinical value is due to the almost perfect mold it gives, of the cavities of the organs into which the contrast medium is injected; namely cervix, uterus, fallopian tubes, and to the permanent record one obtains and to which one can refer in the form of x-ray plates. Through these, a detailed and leisurely study may be performed of the cavities of the organs injected, which study can be done by no other known method.

Bi-manual examination, dilatation and curettage, even hysteroscopy, which, by the way, has never given any startling results or very precise information because the uterine cavity is only a potential one, can, together, give rich and varied data regarding the genital organs of a woman; but no known method, not even laparotomy, can give, so clearly and in detail, the information one can obtain from uterosalpingography. This technique has come as a definite complement to the ordinary methods of investigation, in simple cases, and in certain baffling conditions, where it gives indispensable information and a simple and clear solution to the problem.

Far from being a routine procedure, uterosalpingography has a definite place in gynæcological investigation. However most clinic patients in our department of gynæcology are subjected to this examination and we very often find lesions of the uterus or tubes or even

* From the Department of Gynæcology of Notre Dame Hospital, University of Montreal, Que. Léon Gérin-Lajoie, M.D., F.R.C.S.[C.], F.A.C.S., Professor of Gynæcology and assistant-dean of the faculty of medicine.

cervix which we did not even suspect on ordinary physical examination.

The technique consists in the injection, under the fluoroscopic screen, of a radio-opaque viscous liquid into the cervical canal, and in following the flow of the liquid through the cervix into the uterine cavity, then through the uterine cavity into the fallopian tubes, and through the tubes into the peritoneal cavity when the tubes are patent. The whole procedure should be carried out under the fluoroscope, and we stress this rather than performing a blind injection of a few c.c. of liquid in the office and then taking films, for the following reasons: (1) One can control the injection and be sure that no liquid is extravasated into the vagina. (2) Mucography or visualization of the uterine mucosa can be obtained only by a filling of the uterine cavity under very low pressure so as not to stretch the mucosa by excessive filling and thus unfold its plicæ. This must be done as the uterus is being slowly filled and under direct vision, rather than on evacuation, because evacuation is impossible to control and difficult to photograph. (3) Most important as far as uterography is concerned is the fact that if there should be a sessile or pedunculated growth in the uterus or cervix, under low pressure and at the beginning of the injection, the contrast medium will flow around the growth thus giving a filling defect which can be snapped on a film. As the injection progresses, the opaque liquid completely circumscribing the growth may show no deformity of the uterine cavity. These are some of the reasons why we consider it essential to inject the radio-opaque substance under direct vision, and to follow its progress into the cervix and uterus.

What are the advantages of uterosalpingography? (a) It will confirm a presumptive diagnosis of intra-uterine or intra-cervical lesions such as polyp, fibroid, carcinoma of cervix or body of the uterus. (b) It will permit a detailed radiological exploration of the Fallopian tubes. As a matter of fact radiological exploration of the Fallopian tubes is an important advancement in the study of tubal disease. Before this method was available, palpable lesions alone could be diagnosed. We had no method of estimating the degree of permeability of the tubes, the site of obstruction if any, the degree of mobility of the tubes and finally their retention of liquid (hydro-

salpinx). Clinically, one can estimate the gross modifications in the tubes, that is, those which are palpable. We have no information regarding the slight though important changes in their lumen, as well as greater or lesser permeability. As a matter of fact physical examination will reveal only fairly good-sized utero-adnexal masses. Any tubal lesion which is not palpable goes undiagnosed.

Salpingography shows not only the morphology of the tube, but permits one to study its position, its lumen, finally the ensemble of the tube. Every one knows that tubal insufflation can demonstrate the tube's permeability. All are cognizant of Rubin's experiments, who, while attempting to perform a pneumoperitoneum through the natural passages, stumbled on this ingenious way of testing the patency of the tubes. No doubt this test can detect an obstruction, but it is incapable of localizing it. Indeed this latter information is obtainable by no other method than uterosalpingography and is most important if one should entertain the intention of doing plastic surgery for tubal obstruction. Besides, air is compressible, liquids are not, and this compressibility can be a cause of error on a manometer or kymograph in estimating the flow of air through the tube. Tubal insufflation then, tells one if the tube is patent: nothing more.

(4) It acts as a therapeutic agent in opening non-patent tubes, the proof of which is evident by the numerous pregnancies which follow uterosalpingography in previously sterile women. (5) It permits one to make a differential diagnosis between a tumour of the organs with cavities such as cervix, uterus, tubes, and adnexal or parametrial tumours. This can be done more easily in large tumours protruding into or palpable through the abdomen, by circumscribing the palpable tumour on the skin with a pliable metal wire. Then one proceeds to inject the radio-opaque liquid into the uterus. The cavity of the uterus seen radiologically will be found to be at or near the centre of the area circumscribed by the wire in a uterine tumour, and definitely off centre in a tumour not of uterine origin. (6) To make a diagnosis of certain conditions which would be absolutely impossible to diagnose without this method. Examples of these are (a) carcinoma of endo-cervix or corpus with no history or symptoms usually

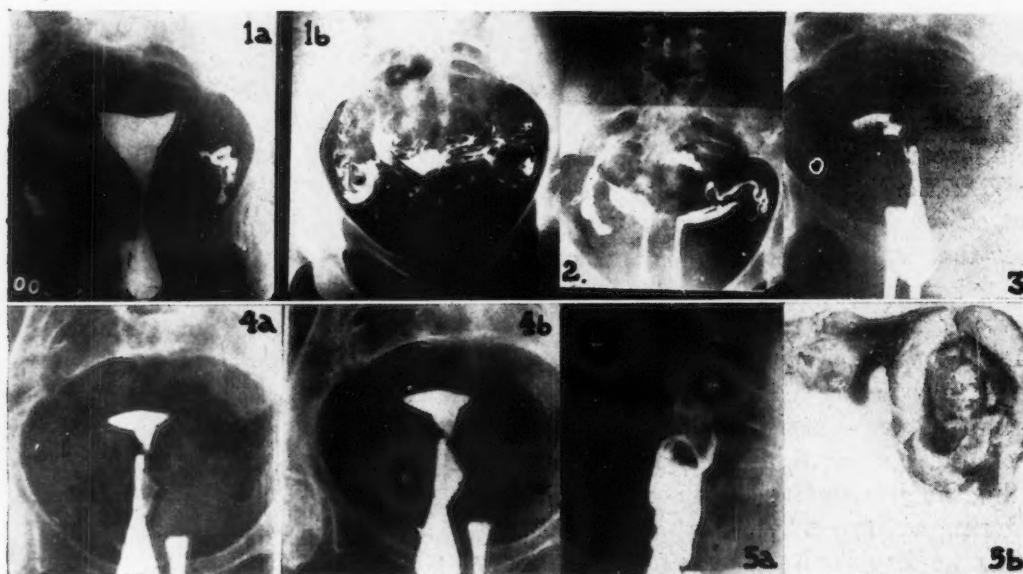
associated with these conditions, (b) intra-uterine tumours in a uterus of normal size and contour, (c) certain cases of hydrosalpinx, (d) it permits one to obtain an image of the cavities of the pelvic generative organs, and also the external shape of these same organs. This information is particularly important in certain cases of pelvic tumour of uncertain origin, and is obtained by associating pneumoperitoneum with uterosalpingography. Also, the use of metal wire in large tumours of pelvic organs, as previously described, gives excellent information regarding the origin of these pelvic tumours.

What now are the contraindications to the use of this method of investigation? The only real contraindication is infection. If there should be any evidence of acute or recent in-

uterine clots can give a very definite filling defect which should not be interpreted as an actual intrauterine tumour. Pregnancy is, of course, a definite contraindication to uterosalpingography.

Clinical presentation.—Fig. 1a is the picture of a normal uterine cavity, showing the typical triangle the base of which is at the superior pole and the apex at the inferior pole of the uterus. Both tubes are well injected, of normal calibre, and one sees the characteristic puff of smoke at the ampulla where the radio-opaque substance flows into the peritoneal cavity. Fig. 1b, the control film taken 24 hours later, shows that large amounts of the liquid have penetrated into the peritoneal cavity.

Fig. 2.—The injection of radio-opaque substance shows very clearly the presence of two



fection such as fever, chills, leucocytosis, high sedimentation rate, purulent lochia or purulent discharge from the uterus, acute infective vaginitis or urethritis, it stands to reason that the infection may be carried up and into the peritoneal cavity.

Bleeding is no contraindication to uterosalpingography. As a matter of fact it may be necessary at times to use this method to find the cause of bleeding. However one must be on the lookout constantly for open blood sinuses in the cervix and uterus which would permit the intravascular injection of the contrast medium. This can be seen readily under the fluoroscope. We have had this "accident" occur at times, but without any untoward results. Also one should remember that intra-

uteri completely independent of each other. Only hystero-graphy can show so perfectly the existence of this malformation, except of course, as in many lesions, laparotomy.

Fig. 3.—This film shows evidence of a large filling defect involving the whole cervical canal and most of the uterus except the bare fundal portion. This patient gave a history of amenorrhœa of 3 months' duration and of one severe hæmorrhage with no subsequent bleeding and no subsequent enlargement of the uterus, though the amenorrhœa still continued for 2 months. Though this is a picture of retained placenta, it can easily be confused with an extensive carcinoma of the fundus because of the marked irregularity of the contour of the filling defect.

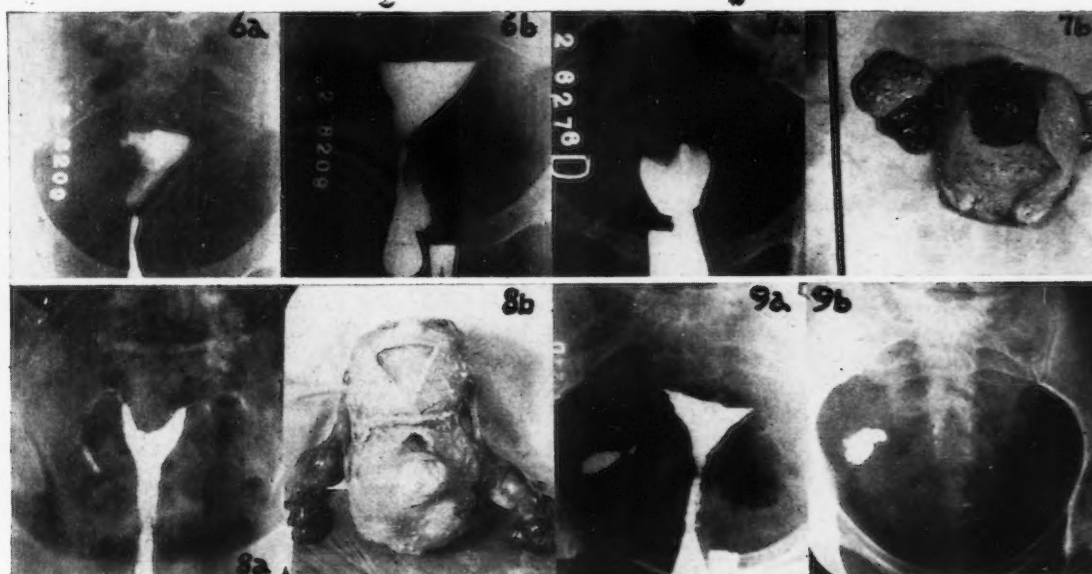
Fig. 4a, with incomplete filling shows an irregular growth occupying the entire cervical cavity. At the isthmus a filiform narrowing blends with the normal, though small, uterine cavity. Fig. 4b, with complete filling the lacuna in the cervical cavity is larger and takes on more definite shape. We have here an endocervical lesion, the presence of which we had completely ignored and did not even suspect until this examination. A D. and C. was performed on the strength of this picture and a report of adenocarcinoma of the cervix was returned from the pathological laboratory.

Fig. 5a shows a large filling defect beginning slightly above the cervical canal and involving the whole uterine cavity. This picture could be confused with that of an incomplete abortion, but the history combined with the radiological

paper and because of which we recommend slow filling of the uterus, under direct vision.

Fig. 7a shows a normal filling of the cervix and isthmus of uterus. At the fundus one notes a large filling defect which would indicate the presence of a tumour in the area. At operation we found a large serous cystic pouch of the left ovary which had ruptured previous to examination. Otherwise the genital organs were normal. On opening the uterus the large sessile myoma seen in Fig. 7b was found.

Fig. 8a.—Uterosalingography shows a large filling defect at the fundus, semilunar in outline, corresponding probably to a fibroid. At laparotomy, nothing unusual was noted. On opening the uterus (Fig. 8b), unfortunately, incorrectly opened, one can see the submucous fibroid causing the filling defect at the fundus.



findings permits a quite definite diagnosis of intrauterine tumour. At laparotomy a uterus of normal size and consistency was found, so much so that a hysterectomy was performed to see if a mistake in diagnosis had not been made. The intrauterine pedunculated fibroid was then found, arising from the region of the right horn and almost filling the whole cavity. Fig. 5b shows the uterus opened to expose the tumour diagnosed by uterography.

Fig. 6a at the beginning of the filling of the uterus one notes two filling defects involving most of the right side of the uterine cavity. Continued injection (Fig. 6b) obliterates the original filling defect as the opaque liquid surrounds the tumours, a fact we pointed out earlier in this

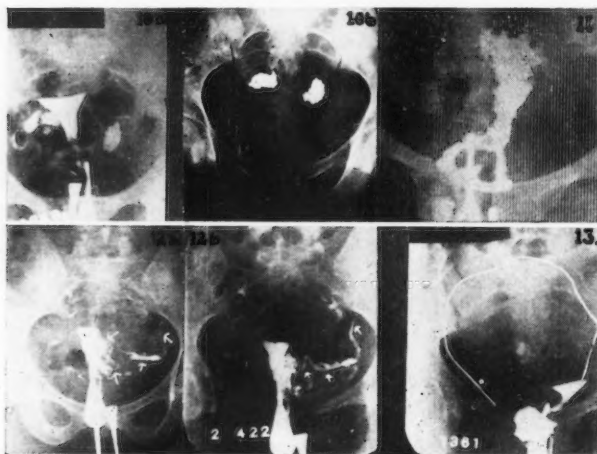
Fig. 9a shows a uterus normal in every way. The left tube is occluded at the horn. On the right, the tube fills as far as the ampulla. Here one notes a distension which takes on the appearance of a cluster of grapes. This picture is truly characteristic of a hydrosalpinx containing droplets of opaque oil. A control film (Fig. 9b), shows complete retention in the hydrosalpinx of the opaque medium.

Fig. 10a.—The filling of the uterus is normal. Both tubes are patent throughout their whole length. At the ampullæ one notes the same typical cluster of grapes picture which again is so characteristic of hydrosalpinx. A control film (Fig. 10b) taken 24 hours later shows retention in the hydrosalpinx of the droplets of oil, with the typical morular conglomerate

tion. It is interesting to note here that besides the hydrosalpinx, these pictures show the exact site of tubal obstruction, which information could never be obtained by the insufflation method.

Fig. 11 shows the typical irregular fungating filling defects which are usually characteristic of carcinoma of the corpus uteri. However, when a D. and C. was performed the pathological report showed a marked hyperplasia of endometrium with no evidence of malignancy.

Figs. 12a and 12b.—These two pictures were added to show that uterosalpingography can, at times, be a hazardous procedure. This patient was bleeding very little at the time of examination. Yet as one can see, especially in Fig. 12b, there is a massive injection of the small veins surrounding the uterus. The opaque medium (lipiodol in this case) can be seen coursing along the utero-ovarian vein, and under the screen was followed up along the inferior vena cava. The only symptom the patient ever complained of was slight headache which may have been caused by a number of conditions besides the intravenous injection of lipiodol. No chest films were taken, because the



patient had absolutely no symptoms referable to the lungs.

Fig. 13.—Patient aged 20. This patient was admitted to the hospital for an abdominal tumour, which filled the pelvis and the left half of the abdomen. On examination, it was impossible to identify the uterus or any particular organ. The tumour, localized as above described, was globular in shape, hard, though slightly fluctuant, immobile and moderately tender. A diagnosis of ovarian cyst was made. Uterosalingography with a metal wire circumscribing the tumour shows the uterus pushed completely

to the left side. As can easily be seen, the uterine cavity is completely off the centre of the area delimited by the metal wire. This proved conclusively that the tumour was not of uterine origin. At operation a large dermoid cyst of the left ovary was found.

Figs. 14a and 14b.—This patient was admitted because of lower abdominal tumour filling the pelvis and extending into the abdomen. A diag-



nosis of uterine fibroids was made. Again a uterography with metal wire was done. As can be seen (Fig. 14a), the uterine cavity occupies the almost exact centre of the area circumscribed by the wire, confirming the diagnosis. Operation proved the diagnosis to be correct (Fig. 14b).

These last two films were made, not for a diagnosis but to illustrate the advantages of this particular method of investigation in cases where the diagnosis might be in doubt.

SUMMARY

1. A method of gynaecological investigation, by visualization of the cervical, uterine, and tubal cavities through the help of a contrast medium and x-rays is described.
2. Technique, indications and contraindications are discussed.
3. Special attention is brought to bear on the fact that the injection of the contrast medium be done under the fluoroscopic screen, to obtain proper metrography.
4. Discussion and interpretation of x-rays.

BIBLIOGRAPHY

1. DOUAY, E.: *Gyn. & Obst.*, 13: 728, 1924.
2. *Idem*: *Gyn. & Obst.*, 16: 361, 1927.
3. BÉCLERE, C.: *L'Exploration radiologique en gynécologie*, Masson & Cie., Paris, 1928.
4. RUBIN, C.: *Perméabilité et obturation tubaire*, Masson & Cie, Paris, 1928.
5. RUBIN, I. C.: *Surg., Gyn. & Obst.*, 46: 87, 1928.
6. RUBIN, I. C. AND BENEDICK, A. J.: *J. Am. M. Ass.*, 87: 657, 1926.
7. GÉRIN-LAJOIE, L.: *Uterosalingography*, *Canad. M. A. J.*, 44: 555, 1941.
8. INGERSOL, F. AND ROBBINS, L.: *Am. J. Obst. & Gyn.*, 53: 307, 1947.
9. BERNSTEIN, P.: *Am. J. Obst. & Gyn.*, 48: 189, 1944.
10. STEIN, I. F.: *Surg. Clin. North Am.*, p. 165, February, 1943.
11. *Idem*: *Surg., Gyn. & Obst.*, 55: 207, 1932.
12. DUFRESNE, O.: *Urol. & Cut. Rev.*, 49: 345, 1945.
13. STEIN, I. F.: *Am. J. Obst. & Gyn.*, 21: 671, 1935.
14. *Idem*: *Radiology*, 15: 85, 1930.

ANATOMICAL BASIS FOR CONTINUOUS CAUDAL AND OTHER FORMS OF REGIONAL BLOCK IN OBSTETRICS

John G. P. Cleland, M.D., C.M., M.Sc., F.A.C.S.

Oregon City, Oregon

REGIONAL block in obstetrics, in the form of continuous caudal analgesia, is being widely and successfully used in many of the larger American hospitals. It is a means of administering sufficient anæsthetic to completely relieve the pains of parturition without narcotizing the baby.^{1, 2, 3,}

The seriousness of the effect of transplacental narcosis in reducing the oxygen supply to the baby's vital centres is now beyond question.^{4, 5, 6} Now this fetal hypoxia has been shown to be caused by ether,^{1, 2} nitrous oxide,^{6, 7} cyclopropane,^{1, 10} the usual rectal analgesic drugs,^{8, 9} and by scopolamine,^{1, 10} morphine,^{1, 11} the barbiturates,^{1, 3, 9, 12, 13, 14} and other brain-drugging agents in common use.^{2, 8, 9, 13 to 16} These agents have also been found to prolong labour.⁹ Prolonged hypoxia is capable of producing the same disastrous effect on the brain as transient anoxia.^{17, 18} Whether the degree of fetal hypoxia is dangerous or not is difficult to gauge because sufficient to depress the child's respiratory centre to the point of apnoea may show no appreciable effect on the mother.^{4, 13, 19} Fetal anoxia, (or asphyxia neonatorum) is well known to cause fetal death.^{3, 13, 14, 16, 17, 20} What is not so generally realized is that, if it does not kill, it may still cause irreparable damage to the child's brain.²¹ This damage is shown as areas of necrosis of the cortex in sections taken from cases which were known to have undergone short periods of anoxia, and died later from some other cause.¹⁸ This damage to the (more susceptible¹⁸) cortex is also apparent clinically in children who have survived the asphyxia, only to remain mentally inferior.^{19, 21, 22, 23, 66} This insidious danger to the race must be eliminated. Modern civilization, however, (after a century of anæsthesia) demands the relief of pain. The possibility of finding a general agent that will depress the mother's brain sufficiently to relieve the severe and prolonged pains of parturition without depressing too much the more delicate baby's brain seems remote.^{5, 13, 15, 24, 25} Therefore the knowledge

gained by scientific research along lines of regional anæsthesia should be carefully considered.

The experimental determination of the nervous connections of the uterus with the cord and and the introduction, in 1933, of the principle of prolonged blocking of these roots by repeated injections,²⁶ have made it possible to completely relieve the pain of parturition with the minimum of effect on mother and child. Thus the pain may be controlled throughout the main course of active labour and the child unaffected by premedication at the time of delivery. The extent to which this is true in the form of continuous caudal analgesia, using the technique established in 1942 by Drs. Robert A. Hingson^{25 to 35} and W. B. Edwards²⁷ was proved at the Philadelphia Lying-in Hospital. A statistical study of more than 2,500 deliveries, with caudal analgesia (averaging three hours in duration), as compared with a control group having the usual anæsthetics and sedatives was published in November, 1946, in United States Public Health Report No. 48.³⁶ This exhaustive analysis revealed an advantage (with no evidence of danger) for the mother of less than one-half the usual blood loss, shortened third stage, less morbidity, less after-pains and subinvolution, *while cutting the infant mortality in half*. That this is also found to be true in other medical centres similarly organized to apply the principle of prolonged regional block by those techniques^{26, 28, 37 to 48, 51} that permit careful anatomic control is apparent by reports published^{30, 42, 44, 46, 47, 61} and in the press.^{49, 50, 51} This method therefore should now be extended to more general use amongst well trained obstetricians and in smaller institutions. Believing that this would be the case if the scientific basis were better understood, and the existence of facilities for mastering a safe technique better known, this brief account of the experimental determination of the nervous connections of the uterus* is herewith presented.

Regional anæsthesia in obstetrics rests upon a sound anatomical basis. This you must understand before attempting to block the sensory nerves in labour in order to avoid, or control the complications caused by involving the main motor nerves, and with them other vital func-

* As given monthly by electrical transcription in Dr. Robert A. Hingson's postgraduate course in anæsthesiology at Johns Hopkins.

tions. The importance of noting changes in sensation in the skin of the abdominal wall in disease of internal viscera was impressed upon me while house-surgeon to Sir Henry Gray, in 1924, at the Royal Victoria Hospital, Montreal. As McGill Cooper Fellow in Professor John Tait's department of postgraduate studies and research during 1925-26, trying to put these clinical observations on a scientific basis by animal experimentation, I evolved a method of determining by which nerve-roots the sensory nerves of an intra-abdominal organ such as the spleen enter the spinal cord.⁵² In 1926-27 my experience at the Royal Victoria Hospital (in obstetrics under Dr. W. W. Chipman), where twilight sleep was no longer being used because of the dangers to the child, convinced me of the great need for the scientific application of regional anæsthesia to obstetrics, and of using this method to perfect it.

My reason for believing this to be possible was my discovery that the sensory nerves of the spleen are much more limited in their distribution to the cord than the motor nerves. If the same were true of the uterus, knowledge of the location of the sensory should enable one to leave enough motor roots unaffected to carry on the normal course of labour. Before embarking on the complicated and difficult experiments that had been evolved using the spleen, it was determined that the uterine sensory supply similarly came within the range of the abdominal visceromotor reflexes, by observing that the pains of uterine contraction were not relieved by a caudal block high enough to render sacral segments insensitive.

Accordingly, using cats and dogs (in the McGill Department of Postgraduate Research), under the controlled conditions of experimentation shown in Fig. 1, contractions of the rectus muscle were recorded on a moving-drum as a sign of uterine sensory activity. This was induced by hydraulic dilatation of the uterus, through a cannula tied in the cervix, by releasing the clamp on the tube to the pressure bottle.

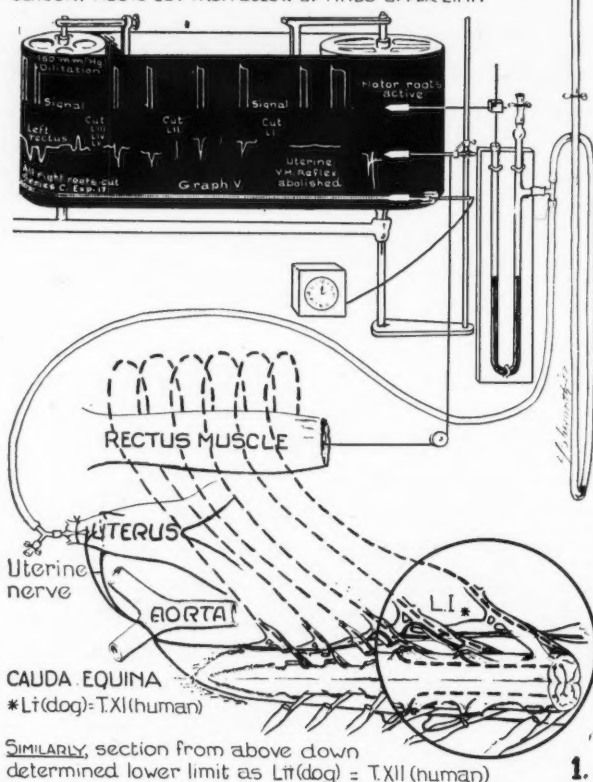
In the first series of experiments the pressure bottle was gradually raised at the beginning until a sufficient squeezing of the uterine sensory receptors had been produced to send a sensory impulse to the cord, betrayed by the reflex contraction of the rectus muscle. The sensory roots, having been exposed by an extensive laminectomy, were then cut from below upward on one

side, recording a visceromotor contraction after each section, until the rectus no longer responded to the uterine stimulus, *viz.*, after cutting lumbar I. Similarly on the opposite side, cutting sensory roots from above downward, the lower limit was determined as lumbar II.

Not yet convinced that only two nerve-roots carried painful impulses from the uterus instead of as many as eleven, variously attributed to it by previous clinical observers,

EXPERIMENTAL DETERMINATION OF SENSORY NERVES OF UTERUS SPINAL DOG

VISCERO-MOTOR REFLEX AS SIGN OF ACTIVITY-UTERINE N.
SENSORY ROOTS CUT FROM BELOW UP FINDS UPPER LIMIT



SIMILARLY, section from above down
determined lower limit as LI (dog) = T.XII (human)

a second series of experiments was undertaken, (at the University of Oregon*). Then, increasingly strong stimuli were utilized to simulate the extraordinarily strong pain of labour. Visceromotor reflexes were recorded for several segments above and below the two originally determined as carrying uterine sensory. These experiments were repeated at as near weekly intervals, over a period of years, as the supply of animals and exigencies of general practice would permit. Finally the explanation was found; that instead of entering only by the roots which were cut, shown in

* Thanks are due to the Department of Physiology, University of Oregon.

black, the painful impulses were spreading by connecting neurons from the opposite side of the cord, and up and down the cord from the point of entry, to affect the motor nerves *shown in broken lines*. Thus was explained experimentally the error of previous opinions of a more extensive sensory supply of the uterus based on areas of hyperæsthesia in labour.

Because of the scarcity of animals one would usually try to save the opposite roots for the other half of the experiment, although the progressive fatigue or reflexes after cutting the cord (under brief ether anæsthesia) at the foramen magnum and the shock of this, and the extensive laminectomy and abdominal operation, rendered many of the experiments inconclusive. The *spinal* animal, with its artificial respiration and heat loss, however, was necessary because general anæsthesia and narcosis had soon been found to depress the reflexes, and it was necessary anyway to eliminate cerebral inhibition of reflexes to make these delicate responses dependable as signs of uterine nerve activity.

It remained for the third series of experiments, with opposite roots cut, (as in the actual record of the experiment shown in Fig. 1) to prove that only the two nerve roots Lumbar I and II actually carry the pain impulses. That the lumbar first and second in the dog and cat correspond to the 11th and 12th thoracic in the human was determined by a similar series of experiments on the Fallopian tube, the contractions of which organ are not strong enough to cause spread of stimuli to adjacent segments, thus rendering the clinical areas of hyperæsthesia dependable for comparison.

Before proceeding to block these nerves in labour, the effect of resecting these nerve-roots in dogs was tried: after which normal parturition occurred.

The clinical application of these experimental findings was begun on May 3, 1932, when the pain of uterine contraction was first abolished by blocking the 11th and 12th thoracic roots only, paravertebrally. The motor activity of labour was apparently not affected. By experimenting on other patients in labour with caudal injections, with and without paravertebral block, the locations of the pathway of pain for the birth-canal and

the main motor pathway of the uterus were also determined. After early labour had progressed painlessly under paravertebral block of XI and XII thoracic roots alone, pain was again stopped by a caudal injection large enough in volume to rise well above these roots: after which labour was arrested for one hour. Painless strong contractions were then observed to recur before the anæsthetic had left the sensory roots, but after it had ebbed from the motor roots above.

With the nerve-pathways of the uterus to the cord clearly identified, it was now possible to carry patients painlessly through the entire course of active labour. I did so first on June 2, 1932, on an eclamptic, (for which regional block was considered a special indication). Labour was painlessly induced by a bag under caudal, and within one-half hour of the pains becoming regular they were abolished by paravertebral block of thoracic 11th and 12th. As soon as stretching pains began to be felt caudal was repeated, and spontaneous painless delivery of a crying baby followed in due course.²⁶

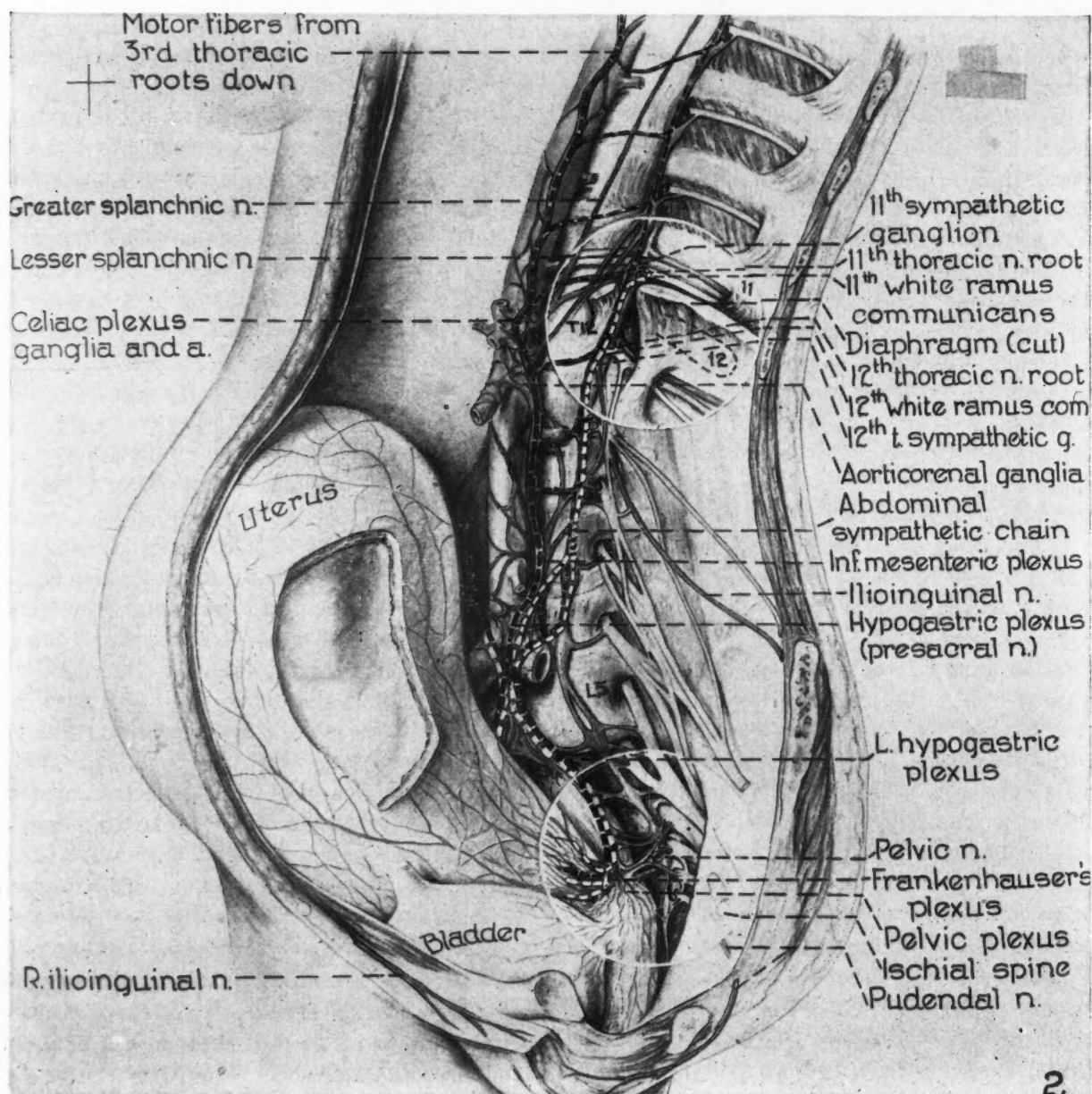
Once it was proved that the pains could be controlled throughout the course of active labour by repeated injections of nupercaine with adrenalin at intervals of about 4 hours, while labour progressed normally to delivery, I hastened to offer my findings for publication; so that others, especially those whose opportunities were not confined to private practice, could use them. Other cases followed (during the depression years only when specially indicated—breech presentations being a dramatic example) and caudal was also used alone: but all the essential facts of the nerve supply having been published in 1933, no supplemental report was offered.

It was not until Dr. Robt. A. Hingson took up the work that general progress was made. The greatness of his contribution is apparent to you on all sides.^{27 to 35, 48, 50, 53 to 60} Meanwhile my clinical experiments on private patients proceeded carefully to determine the exact course of the pain pathway of the uterus from the presacral nerve to the 12th and 11th thoracic roots, and also the effect on uterine contractions of blocking it in various places. Before attempting to do so, it was necessary to develop techniques of paravertebral block of thoracic roots and lumbar sympathetic chain so exact in relation to bony landmarks, that the nerves could be

blocked with a quantity of anæsthetic insufficient to affect other structures. The techniques developed were based on anatomical studies at the University of Oregon anatomy laboratory* and autopsy rooms† by dissections and methylene-blue injections. As little as 2½ c.c. was found sufficient to fill the paravertebral space to in-

plexus. Obviously the usual dose of 20 to 30 c.c.** would effect this.

In developing these techniques the necessity of avoiding penetration of the dura was considered and the intradural injection of a dye solution that jelled when cold demonstrated that in the lower thoracic and upper lumbar region



clude the rami communicantes but not the sympathetic chain, and as little as 6 c.c. at a measured distance from the back of the transverse process, sufficient to block the lumbar sympathetic chain without affecting the aortic

the dura did not extend beyond the intervertebral foramina.* Judging by the results of the first hundred attempts at paravertebral block over the upper four transverse processes, in at least 87% all the uterine sensory fibres were proved to be contained in the lumbar sym-

* Thanks are due to the University of Oregon Medical School Department of Anatomy.

† Thanks are due to Dr. Warren Hunter and the Department of Pathology, University of Oregon.

* Thanks are due to Dr. Olof Larsell, Professor of Anatomy, University of Oregon.

pathetic chain by the complete relief of all pain of uterine contraction.

The sensory pathway from the uterus was followed from the presacral nerve through the IV and III lumbar sympathetic and along the chain to the XII and XI thoracic roots via the rami communicantes as shown in Fig. 2 by the broken white line. All the pain fibres were more constantly blocked when the lumbar sympathetic was injected at or above the level of the L. III transverse process. The sensory pathway from the birth canal was followed into S. IV, III and 2nd roots.

MOTOR SUPPLY TO THE UTERUS

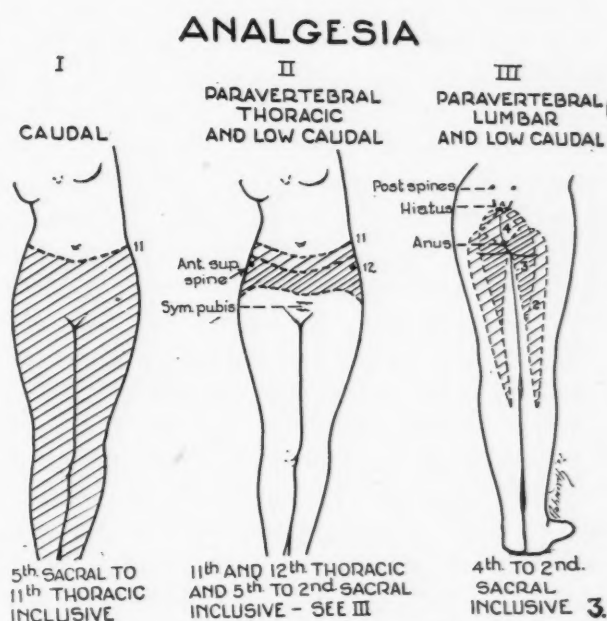
The motor nerves to the uterus (shown in black dotted lines, Fig. 2) were studied by hysterographs on a kymograph* (Fig. 1) recording the actual intra-uterine pressure during contractions of labour under the influence of (a) caudal block at various levels compared with those under (b) paravertebral block of the XI and XII roots, and (c) paravertebral lumbar sympathetic and (d) combinations of paravertebral with low caudal, all compared with painful labour before and after. Studies of these tracings show that paravertebral block of thoracic XI and XII while abolishing the pain of contraction, does not inhibit the motor activity. High caudal and paravertebral lumbar were seen to depress the strength of contractions somewhat except in late labour, the depression in caudal being proportioned to the height of analgesia reached, and decidedly greater above the XI.

These experimental findings were confirmed in the course of routine clinical observations over a period of years. Whenever loss of motor power beyond the transient effect of adrenalin or ephedrine was noted, it was carefully analyzed in relation to the nerves involved and the other routine data such as frequency and duration of contractions, blood pressure, pulse and fetal heart, dilatation of cervix and station of presenting part, tonus of the uterus, all compared with the rest of the course of labour.

Judging by more than fifty instances of loss of motor power, ranging from 1/2 hour of mild inhibition to complete arrest of labour, the following tentative deductions were made: (1)

* Thanks are due to the University of Oregon, Physiology Department.

The motor supply from the cord to the uterus is extraordinarily wide, extending from the III thoracic to the II lumbar (possibly L. III) as shown in broken black line, Fig. 2. (2) From the nerve roots the motor fibres course partly through the sympathetic chain, partly through the aortic plexus to the ganglia alongside the cervix^{55, 56} where they synapse with the intrinsic nerve-supply. (3) Motor impulses from the higher centres are much more effective by comparison than those derived from the higher centres in animals; and conversely, the motor centre in the lumbar cord is comparatively less effective: thus explaining the practicability of caudal anaesthesia in which the lumbar



enlargement must be blocked to reach the pain-carrying nerve roots. (4) The lumbar motor centre is sufficiently important, however, that if caudal is given too early it will depress the strength of contractions, and may arrest labour, and if given over too long a period of time may depress the tone of the uterus. (5) If caudal is postponed (while the lumbar motor centre is allowed to act) until labour is well established, the more powerful stream of impulses from the higher centres will then carry on labour until the intrinsic motor supply has taken over towards the end of labour, when it is possible for labour to proceed automatically to deliver even when the entire extrinsic motor supply has been cut off. This explains the success, in spite of large doses, of those who tried caudal before the determination of the

sensory supply of the uterus, when they used it *only* in late labour or for operative delivery.

SKIN AREAS OF ANALGESIA

I would like to emphasize the importance of the practical application of this research in administering continuous caudal analgesia. Fig. 3 shows the average level of the top of the XIth thoracic skin segment which must be anaesthetized before complete relief of all pain in caudal is attained. From careful measurements in 30 patients it averages $1\frac{1}{4}$ inches below the umbilicus. If you do not start caudal too soon, and do not inject so much as to carry the analgesia above the umbilicus, labour will progress satisfactorily. To estimate the size of the initial dose of metycaine correctly I have found pelvic measurements to be a useful index, and by checking the level of analgesia resulting, that the use of two-thirds of the corrected initial dose will maintain the analgesia below the tenth thoracic, (thus to avoid paralyzing the coeliac plexus which is supplied by the Xth with the 9th thoracic through the lesser splanchnic nerves).

If you fail to be guided by the level of analgesia in continuous caudal you may, unwittingly, involve the main splanchnic nerves with the attendant danger of profound fall of blood-pressure, which may cause serious fetal⁵⁷ and even maternal complications. These may be difficult to combat,⁵⁷ and therefore must be prevented by techniques that permit careful anatomic control. It was to eliminate the inherent necessity of subjecting the child to the anoxemia which accompanies analgesics and general anaesthetics in doses adequate to control pain, that these researches to perfect an alternate method that inherently protects the child, have been, and still are being carried on.

NOTE.—The extensive bibliographic references shown in the text may be had on application to the author.

I am indebted to Miss Bertha B. Hallam, Librarian, and staff, of Oregon Medical School Library for active co-operation in discovering, locating and sending literature on this subject over fifteen years.

For the physician there is only one rule; put yourself in the patient's place.—Lord Lister.

A NUTRITION SURVEY ON A NOVA SCOTIAN ISLAND

L. B. Pett, Ph.D., M.D. and F. W. Hanley, M.D.

Nutrition Division, Department of National Health and Welfare, Ottawa, Ont.

FOOD supplies in Canada during 1944-46 were about enough to feed everyone adequately if distributed equitably. In a country like Canada, such distribution is difficult, and pockets of underfeeding are to be expected. It is important to practitioner and public health officer alike to know something of the extent and nature of any malnutrition resulting among the underfed. In addition there are those malnourished by reason of conditioning factors such as occupation, age and disturbed digestion. It is therefore important to estimate from time to time how many actual cases of malnutrition exist in the population and how many people are in a border-line condition, liable at any time to cross over the ill-defined zone into actual debility.

This paper reports a survey among fishing-farming folk on an island close to the coast of the Atlantic province of Nova Scotia. It is of special interest because the general conditions are not unlike those described for Newfoundland and for the Gaspé, as well as for other parts of the Maritimes. The diagnoses reported here differ rather sharply, however, from the report of a recent survey in Newfoundland,¹ and one for the Gaspé.²

Disagreement with results by other investigators is not unexpected in the field of mild malnutrition, in which diagnoses are so difficult that there has arisen the illogical term of "subclinical" conditions. Under this term are sometimes listed only dietary studies or a few blood analyses, or just lists of symptoms or signs. Such individual procedures do not yield diagnoses, and therefore conjure up shadowy pictures rather than defining the state of health in a manner permitting comparison. If there is observable impairment of function or tissue then the matter is within the clinical sphere, and if nothing can be observed, then it is only speculation.

A few deaths are recorded every year in Canada as primarily due to certain deficiency diseases. Confining attention only to those certified by physicians shows that rickets leads

all the rest by a long margin. Rickets is a preventable disease by means of administration of cod liver oil or some other source of vitamin D to all children regularly. Rickets was encountered in the present survey in a considerable percentage of children, including one frank case, while very few cases were indicated in Newfoundland or the Gaspé Peninsula by the above noted investigators. Both Newfoundland and Gaspé reports noted extensive incidences of signs attributed to deficiencies of vitamins B or C. In this report only two persons considered to have definite riboflavin deficiency (and another two with ascorbic deficiency) were found, and none with definite deficiencies of thiamine or niacin. Several others were found to have probable deficiencies of these factors, however.

METHODS AND MATERIAL

Madame Island is in the Strait of Canso off the southeast coast of Cape Breton Island. About 4,000 people live on the island, and live chiefly by fishing. They are chiefly of Acadian, French-speaking origin, and live in small settlements around the coastline. Transportation is by road or boat and large stores are lacking. Electricity is available, but many items such as coal are expensive.

The group surveyed (105 families) had an average size of 5.0 members, of whom only 359 completed the survey. The ages ranged from 1 to 77 years, with those over 45 forming 18.9% of the total. The sample represented about one person in 10 on the island.

Diet records for a one-week period were obtained between February 19 and March 18, 1947. Sixty-eight per cent of those who kept records later kept appointments for the clinical part of the survey; this is good considering the amount of snow and the difficulties of transportation.

The methods generally were the same as those described before.³ In the physical inspection weights and heights were taken with outer clothing and shoes removed. Children were stripped to the waist so as to examine posture, rickets, etc. The physical inspection included in each case a thorough examination of skin, nails, tongue, gums, lips and eyes, a measurement of the amount of subcutaneous tissue and observation of certain tendon reflexes and vibratory sense, and inspection of the teeth,

tonsils, throat and thyroid gland. Blood pressure readings were taken for most adults and many children.

RESULTS

1. *Food habits.*—The foods most lacking in the diets at the time of the survey were milk, all fruits (but especially citrus fruits or tomatoes), whole grain cereals, cheese, and fish liver oil. Very little use was being made of iodized salt, but this is not so important for a community by the sea. In addition to these more neglected food groups, the intake of vegetables other than potatoes, of bread and eggs, showed room for improvement.

The lack of milk and cheese together seriously jeopardizes the chances of a satisfactory intake of calcium and riboflavin. Calcium is especially important for children, who may also have insufficient protein for growth if their milk intake is unsatisfactory. The cost of milk on this island was probably one reason for the lack of this item in the diet. Citrus fruits and tomatoes are the most uniform source of ascorbic acid in the diet, while other fruits and various vegetables provide an additional, although irregular, source. The neglect of these two groups was only partly offset, as far as ascorbic acid is concerned, by a relatively good intake of potatoes and green and yellow vegetables. The lack of fruits may be partly unavailability at the season of the survey, and partly due to their cost. The neglect of cereals other than bread limits the intake of thiamine and iron, thereby increasing the possibility of thiamine deficiency and anæmia.

The fish liver oil intake must be examined by age groups, rather than as a single figure. Even in the youngest age group (0 to 5) there were 37% not getting enough fish liver oil; this is reflected in the indications of rickets in the whole group (including adults) of 13%.

2. *Quality of the diets as a whole.*—The diets have been classified into four categories:

	Percentage of total
Good diets:	
Above minimum in all of 8 food groups. . .	5.5
Borderline diets:	
Minimum or below in 1, 2 or 3 food groups.	76.0
Poor diets:	
Minimum or below in 4, 5 or 6 food groups.	18.5
Extremely poor diets:	
Minimum or below in 7 or all food groups. . .	0.0

The minimum score for any food group is already weighted for importance and represents in fact less than half the amount of that group that is currently recommended as optimal for the highest requirement anyone might have. In compiling the table, only a limited number of food groups was chosen, *viz.*: milk; citrus fruit and tomatoes; potatoes; green, yellow and other vegetables; whole grain cereals; bread; meat and alternates; fish liver oils (included only for those 12 and under).

This particular selection of seven or eight foods was made because the neglect of any one may have important effects on the health of the individual. The likelihood of deleterious effects increases with an increasing number of food groups falling into the minimum or below (including zero) category. If four or more of the eight groups are minimum or below in any individual's diet, that person is definitely eating a poor diet and is very likely to become malnourished. The table shows that 18.5% fell in this category, although none of these was eating an extremely poor diet. For the middle 76% of the persons there is a good possibility that improved diets would make a distinct contribution to health. Only 5.5% were in the zone of dietary safety, and even these fell below some of the current recommendations for a good diet.

3. *Results of physical inspections.* — (a) *Heights and weights.* There are still no completely satisfactory methods of interpreting height and weight measurements, even though thousands are performed annually. For children it is better to compare one measurement with a previous one on the same child, rather than comparison with a table. For adults the tables are also of uncertain standardization. In children underweight and thinness are often forerunners of severe illness. In adults both underweight and overweight are associated with higher rates of some diseases and with shorter life than those nearer average. Weights may be average, or above or below the average. Within 10% above or below the average may still represent a zone of "normality", and not be a special threat to longevity.

Among children aged 5 to 18, 6.8% of the males and 25.3% of the females were more than 10% below the Baldwin-Wood standards; 2.7% of the males and 3.2% of the females were more

than 20% below the standards. On the other hand, 10.9% of the males and 9.5% of the females were more than 10% above the standards.

Among adults, 40.8% of the males and 34.4% of the females were more than 10% below the standards, with 11.5% of the females more than 20% below; 10.2% of the males and 27.1% of the females were more than 10% above, with 16.7% of the females more than 20% above. From these figures one might infer that many females 5 to 18 were likely to be below optimal

TABLE I.
COMPARISON OF WEIGHT IN PERCENTAGE OF STANDARD
WEIGHT FOR GIVEN AGE AND HEIGHT
AGE 5 TO 18 (BALDWIN-WOOD STANDARDS)

Percentage of standard weight for age and height	Males		Females	
	No.	%	No.	%
Above average				
20 or more	1	1.4	2	2.1
10 to 19.9.....	7	9.5	7	7.4
0 to 9.9.....	22	29.7	17	17.9
Exactly average.....	4	5.4	8	8.4
Below average				
0 to -9.9.....	33	44.6	34	35.8
-10 to -19.9.....	5	6.8	24	25.3
-20 or less.....	2	2.7	3	3.2
AGE OVER 18 (MEDICO-ACTUARIAL STUDY)				
Above average				
20 or more.....	3	6.1	16	16.7
10 to 19.9.....	2	4.1	10	10.4
0 to 9.9.....	9	18.4	14	14.6
Exactly average—none				
Below average				
0 to -9.9.....	15	30.6	23	24.0
-10 to -19.9.....	18	36.7	22	22.9
-20 or less.....	2	4.1	11	11.5

weight, much more so than the males of the same age group. Both male and female adults tended to have low body weights, but there was much more variation of body weight among the women.

This result might be "normal" for the group studied, having regard to heredity factors in body build, except for the extreme variation. The figures are roughly similar to those reported for Newfoundland,² having actually more people of low body weight, but also more of high body weight.

(b) *General physical findings* (see Table II).—

About one person in ten had some form of respiratory infection at the time of examination, while more than one in four had enlarged or infected tonsils. These, occurring more commonly among children, were undoubtedly responsible for much ill health. A large percentage showed blood pressure readings usually considered above normal, although more than

TABLE II.
INCIDENCE OF CERTAIN FINDINGS NOT USED
IN THE DIAGNOSIS OF MALNUTRITION

<i>Condition</i>	<i>Moderate</i>	<i>Marked</i>	<i>Severe</i>
Respiratory infection.....	9.6	0	0
Enlarged and/or infected tonsils.....	21.8	4.4	0
Underdevelopment.....	0.8	0	0
Enlarged thyroid.....	2.6	0	0
Scabies.....	0.6	0	0
Conjunctivitis.....	1.4	0	0
Mottled teeth.....	0	0	0
Evidence of heart disease..	0	0	0
Below average blood pressure: adults	3.5	0	0
children.....	3.1	0	0
Above average blood pressure (persons 18 and over)*	29.7	4.5	0

*Criteria

Moderate: 140–179 systolic or 90–109 diastolic

Marked: 180-229 " " 110-129 "

Severe:	230	+	"	"	130	+	"
---------	-----	---	---	---	-----	---	---

one reading would be necessary to determine if this condition were more than temporary in all cases.

(c) *Signs of nutritional significance.*—A table listing individual signs is not given because it gives a false sense of constituting diagnoses. Such a table is available from the authors. Table III gives the incidence of conditions related to nutrition.

TABLE III.

SHOWING THE INCIDENCE IN PERCENTAGE OF FOUR
GENERAL CONDITIONS WHICH ARE TO SOME EXTENT
RELATED TO POOR NUTRITION

	<i>Moderate</i>	<i>Severe</i>	<i>Extreme</i>	<i>Total</i>
Thinness.....	4.1	0	0	4.1
Obesity.....	8.6	0	0	8.6
Carious teeth.....	39.0	13.3	0.8	53.1
Poor posture.....	33.2	1.4	0	34.6

Thinness and obesity in Table III were based on the general appearance, plus a weight more than 10% below or above average, plus a subcutaneous tissue measurement according to the following, as determined from the distribution curves.

Age group	5 to 11	12 to 17	18 & over
	<i>Males</i>		
Deficient.....	7 & under	5 & under	4 & under
Excessive.....	17 & over	15 & over	14 & over
	<i>Females</i>		
Deficient.....	0 & under	9 & under	9 & under
Excessive.....	17 & over	19 & over	29 & over

The figures represent the thickness of a double layer of skin and subcutaneous tissue as taken up in a fold about two inches above the elbow, and measured in millimetres.

Carious teeth were estimated by the use of a tongue depressor only, and include decayed, missing or filled. Since "moderate" refers to more than four carious teeth this is a very limited picture of this condition.

Hæmoglobin.—Table IV gives the hæmoglobin values by age and sex. The average value of children under 12 was 12.4 gm. per 100 c.c. which may be compared with values like 12.8 for children in British Columbia or 13.3 gm. in Saskatchewan, as obtained by the same method.

TABLE IV.
HEMOGLOBIN VALUES BY AGE AND SEX

No.	Average gm. per 100 c.c.	Range gm. per 100 c.c.	Standard deviation
Under 12 years....109	12.4	9.7-14.3	2.47
Males 12 and over.. 86	13.8	11.9-15.7	1.16
Females 12 and over162	12.7	7.3-15.7	3.89
357			

Serum ascorbic acid.—Table V gives the results of this estimation by age groups. It will be noted that extremely low and extremely high values occurred in all age groups. Of the whole group 28.7% had values below 0.4 mgm. per 100 c.c. which some people consider as the lower limit of normal. These estimations were made in March, and very few of the people were using any citrus fruit or tomatoes, yet the *average* level of each age group was not particularly unsatisfactory. Individual cases whose source of vitamin C did not include citrus fruits, had some of the high blood levels.

TABLE V.
ASCORBIC ACID VALUES BY AGE GROUP

<i>Age</i>	<i>Number</i>	<i>Average mgm. per 100 c.c.</i>	<i>Range mgm. per 100 c.c.</i>
0-5	24	0.76	0.22-2.03
6-11	73	0.70	0.02-1.79
12-29	91	0.64	0.03-2.03
30-44	44	0.55	0.08-1.59
45 plus	46	0.52	0.02-2.14
Total	278	0.63	

These findings must be considered with the finding of 14% of the whole group with red and swollen gums, which are reported to occur more frequently on low intake levels of ascorbic acid, even though not cured by it.⁴

The numbers and percentages of persons with definite malnutrition diagnosed by special criteria³ are given in Table VI.

TABLE VI.
INCIDENCE OF DEFINITE MALNUTRITION ON
ISLE MADAME

Condition	No. of persons	Percentage of number examined
1. Anaemia.....	23	6.4
2. Thinness.....	14	4.1
3. Past rickets.....	7	3.8
4. Riboflavin deficiency.....	2	0.6
5. Ascorbic acid deficiency.....	2	0.6
6. Vitamin A deficiency.....	0	0
7. Niacin deficiency.....	0	0
8. Thiamine deficiency.....	0	0
9. Protein deficiency.....	0	0

TABLE VII.
INCIDENCE OF PROBABLE DEFICIENCY ON
ISLE MADAME

Condition	No. of persons	Percentage of number examined
1. Dietary inadequacy— Entire group.....	97	18.4
Clinic ".....	64	17.8
2. Past rickets.....	18	9.4
3. Riboflavin deficiency.....	27	7.6
4. Ascorbic acid deficiency.....	16	4.5
5. Vitamin A deficiency.....	9	2.5
6. Possible protein deficiency.....	3	0.9
7. Niacin deficiency.....	2	0.6
8. Probable protein deficiency....	0	0

TABLE VIII.
DISTRIBUTION OF MALNUTRITION BY AGE GROUPS AND SEX

	0 to 5		6 to 11		12 to 29		30 to 44		45 +	
	M	F	M	F	M	F	M	F	M	F
No.....	9	2	14	15	18	29	4	14	5	12
Percentage..	7.4	1.6	11.5	12.3	14.8	23.8	3.3	11.5	4.1	9.8
Total males.....	50									
" females.....	72									

TABLE IX.
DISTRIBUTION OF CASES OF MALNUTRITION BY SIZE OF FAMILY

	1	2	3	4	5	6	7	8	9	10	11	12	13
No....	1	9	19	19	12	18	17	9	2	9	0	3	4
%....	0.8	7.4	15.6	15.6	9.8	14.6	13.9	7.4	1.6	7.4	0	2.5	3.3

In addition to those persons on whom a definite diagnosis could be made, there was a somewhat larger group who, because they were close to a definite deficiency, might be said to have probable deficiency. From the point of view of the public health worker, these should be given as much attention as the preceding group and the total public health problem is the sum of the two tables. The incidence of probable malnutrition is given in Table VII.

Nutritional deficiencies are usually considered as being multiple but in this survey the number of individuals with one deficiency was

107 out of a total of 122 showing deficiencies.

Malnutrition of all types was combined to study the incidence according to ages, sex, size of family and occupation, with results shown in Tables VIII, IX, and X.

Of the five pregnant women, three showed deficiencies: one had protein deficiency and anaemia, one had riboflavin deficiency, and the third had anaemia.

TABLE X.
DISTRIBUTION OF CASES OF MALNUTRITION
BY OCCUPATIONS

	Pre-school	School	Housework	Fishermen	Others
No....	10	52	36	10	14
%....	8.2	42.6	29.5	8.2	11.5

Although the number of cases is small in most instances, the following conclusions seem justified: (1) More cases occurred in the age group 12 to 29 than in any other, and more among females than males. Pregnant women were especially affected. (2) More cases occur in medium-sized families (3 to 7 persons). (3) School children have the highest incidence of malnutrition, with housewives next and pre-

school children and fishermen having the lowest. Thus, one of the most important groups from the view-point of the future health of the community is suffering most—nearly one in every two children.

SUMMARY

This nutrition survey combining dietary studies, physical examinations, and biochemical (blood and urine) analyses was carried out on 359 persons of all ages on Madame Island, Nova Scotia. The survey has helped to define the type and extent of the nutrition problem

of the group. It also has implications for the province as a whole. Conditions generally appear to be similar to those described by Adamson *et al.* for Newfoundland but the actual incidence of malnutrition can not be directly compared.

The important conclusions which emerge are as follows:

1. No scurvy, beri-beri, starvation or other marked deficiency diseases in acute form were encountered, except one frank case of rickets.

2. Milder degrees of malnutrition were found in small to moderate percentages of the group, the exact incidence depending on the type of malnutrition.

3. *Anæmia* was judged to be present in over 6%, and was more common among women and children. The deleterious effects of anæmia are lack of energy and endurance, easy fatigability, and lessened ability to withstand disease.

4. *Thinness* was found in 4% of those studied. This emphasizes the fact that malnutrition resulting from insufficient calories is still more important, even in Canada, than specific vitamin deficiencies.

Females aged 5 to 18 tended to have lower than average weights than males, and adults tended to be lower than children in relation to their averages. All children 5 to 18 were considerably below the normal for an Iowa group in both height and weight.

Thinness is a disadvantage in several respects. It means that the individual is not getting enough food for reserves of energy as well as for immediate use. This becomes important during disease or after injury, and is especially important in children. Even while well, a low energy supply may require use of protein which is essential for growth and repair of body tissues. The thin person, then, may not reach his full capacity for growth, work or play, and may suffer more than average during illness. Finally, a body that is not getting enough energy may be inadequately supplied with other nutrients, and is more likely to have or to develop other types of deficiency.

5. Almost 4% of the children showed clear evidence of having had *some degree of rickets* during early life, and another 9% probably had the disease. This is consistent with the fact that a large percentage of children recorded no intake of fish liver oil.

6. *Vitamin deficiencies* were not common considering the low economic status of the group and the faulty food habits. Definite riboflavin deficiency occurred in 0.6%, and probable deficiency was found in 7.6%. Definite ascorbic acid deficiency also occurred in 0.6%, while probable deficiency was diagnosed in 4.5%. No definite vitamin A, niacin or thiamine deficiency was found, but probable deficiency occurred as follows: vitamin A, 2.5%; niacin, 6.0%. Possible protein deficiency was found in three persons. More than one-quarter (29%) were not getting ascorbic acid in desirable amounts to give them a margin of safety.

The figures for anæmia, rickets, and vitamin deficiencies are all minimum values—that is, they are based on a conservative interpretation of current knowledge. Single signs ascribed to deficiencies occurred with greater frequency than these figures indicate. For example, red and swollen gums occurred in 14% of the group, but their cure is a matter of dental service and oral hygiene, rather than treatment with ascorbic acid; the latter would help to prevent a recurrence.

7. Malnutrition (all types) was found more commonly in females and in the age group 12 to 29. Medium-sized families were more often affected. School children and housewives suffered more than any other occupational group.

8. The diagnoses made as a result of this survey are of the conditions *per se* and do not prove that these conditions are necessarily or entirely due to faulty diet. However, this is the most likely cause in most cases, as a study of the diet records tends to confirm. For example, milk, which is our main source of riboflavin, was taken in insufficient amounts by a large proportion of children; fish liver oil, which prevents rickets, was not being taken by most children; and fruits, which supply ascorbic acid, were frequently lacking. Other possible or additional causes, such as infection or disease, were not sought exhaustively in the brief examination used.

9. The *food habits* of this group plus others (total 526) indicated a lack of milk, fruits of all kinds (especially citrus), cereals, cheese, and fish liver oils. Other foods which could be improved in the diet were green and yellow vegetables, bread, and eggs. This dietary pattern probably represents winter and early spring months. Nearly 20% were eating diets likely

to produce malnutrition. The quality was worse among children under 12, and among larger families.

Dr. L. Richter, Dalhousie University, in the course of studying costs of rural health services, initiated the idea of this nutrition survey.

Grateful acknowledgment is made of the assistance of Misses Helen Sackville, Dorothea Tripp, Doris Norman, Edith Perkins, Karen Porsild, Velma Tugman, and clerks and stenographers, all of the Nutrition Division. The support of Father Poirier, Father Boucher, and Father Boudreau greatly facilitated our work. The public health nurse for the county, Miss Blanche Martel, was also most helpful.

REFERENCES

1. ADAMSON, J. D. *et al.*: *Canad. M. A. J.*, 52: 227, 1945.
2. BALL, M. V., BROUHA, L., GASNIER, A. AND TREMBLAY, J. L.: *Laval Med.*, 11: 3, 1946.
3. PETT, L. B. AND HANLEY, F. W.: *Canad. M. A. J.*, 56: 187, 1947.
4. LINGHORNE, W. J. *et al.*: *Canad. M. A. J.*, 54: 106, 1946.

VITAMIN C CONTENT OF DIETS OF LOWER INCOME TORONTO FAMILIES*

Elizabeth Chant Robertson, M.D., Ph.D. and Margaret E. Galloway, B.Sc.†

Toronto, Ont.

OUR purpose in this study was to find out how much vitamin C was eaten daily by 113 children and adults living at home in Toronto during the late winter months of 1948. We wished also to determine how much of this vitamin was derived from Canadian and how much from imported foods.

In the dietary surveys carried out in 5 Canadian cities in 1939 and 1943,¹ a deficiency of vitamin C was a common finding. In these surveys the amount of this vitamin was calculated from food tables. In the present study the food as prepared for eating was collected and its vitamin C content was determined by chemical assay, as this provides a more accurate measure of the intake than the use of food tables.

There are only four reasonably-priced Canadian foods² that contain high or even moderate amounts of vitamin C. These are cabbage, turnips, tomatoes (raw, factory canned or juiced) and potatoes that have been stored less than four months. Except for the "fresh" potatoes, these foods are available throughout most of the year. Unfortunately when cabbage, tur-

nips or potatoes are cooked, much of this vitamin is usually lost.³ Four raw Canadian fruits, strawberries, raspberries, currants and cantaloupe also contain high amounts of this vitamin,² but they are relatively dear and are available for a short season only. The other members of the cabbage family² are even richer in vitamin C than cabbage but again they are expensive and available for only a short time in the year.

Present study—selection of families.—The 64 families used in the present study all included children who were serving as control subjects in the Canadian Red Cross Society's school meal study. In other words, these children ate all their meals at home and they were not given any special education in the choice of their food. We are much indebted to the staff engaged in that study for their assistance.

The income earned by the fathers or mothers and in two instances by both parents in these families, which were of Anglo-Saxon descent for the most part, is shown in Table I. In

TABLE I.
INCOME OF FAMILIES PER YEAR (SPRING, 1948)

Under \$1,100.....	3.5% of families
From \$1,100 to \$1,500.....	12.5% " "
" \$1,500 " \$2,500.....	70.0% " "
" \$2,500 " \$3,600.....	14.0% " "

6 of the families the income came from relief, pensions, or a combination of the two. It is evident from Table I that most of the families had incomes from \$1,500 to \$2,500 per annum, the commonest wage (in 17% of them) being \$2,000. So far as dependent children were concerned, 52% of the families had one or two such children, 33% had 3 or 4, and 15% had 5 to 8. As any older children who were working contributed at most only enough money to cover their board and lodging, their wages have not been included in the above figures. The information on the family incomes was obtained by the senior author who interviewed the families in their homes.

Method of collection of food.—This investigation was carried out between January 12 and March 23, 1948.

The mother was visited in her home by the dietitian (M.G.), and she was asked how much citrus fruit or citrus fruit juice or tomato juice the child had eaten in the previous twenty-four hours. She was instructed not to change the amount of these particular foods in the fol-

* From the Department of Paediatrics, University of Toronto, and Hospital for Sick Children, Toronto, under the direction of Alan Brown, M.D., F.R.C.P.(Lond.).

† Swift Research Fellow.

lowing 24 hours during which the food was to be collected. This precaution was taken because in a few preliminary trials some of the mothers had fed their families abnormally large amounts of these foods following the interview with the dietitian. In other words, these mothers wished to make a good showing in the test and in order to do so they departed from their usual practices. In most cases when asked to keep the intake of citrus fruits or tomatoes at the previous level, the mother followed these instructions faithfully. In no case did she reduce the amounts used. She was asked to start collecting the child's food when he returned from school that afternoon, and to continue doing so until after his noon meal the next day. If the child ate an orange or part of a grapefruit, she was asked to save another orange or grapefruit from the same lot. She was given a watertight cardboard carton into which the same amount of orange juice, grapefruit juice or tomato juice as the child drank was to be put. (None used both citrus juice and tomato juice.) This carton was to be kept as cold as possible, preferably in a refrigerator. Previous studies⁴ had shown that there is little loss of vitamin C in such foods in 24 hours, even when kept at room temperature.

During the same 24-hour period, she was asked to cook an extra serving of all the foods containing vegetables or fruits. She was given a large-mouthed bottle containing 300 c.c. of 3% metaphosphoric acid into which she was asked to put as much of the fruits and vegetables, or foods containing them, such as jam, marmalade, soup, pickles, catsup, etc., as the child ate, in the state in which they were eaten. Dried fruits, such as raisins, currants or peel when present in baked goods were not collected. She was asked not to put beets in the bottle as their red colour interferes with the subsequent chemical test. Fortunately cooked beets contain small amounts of vitamin C (about 4 mgm. per 100 gm.) and they were rarely served by these families. If the fruits or vegetables were combined with other foods the mother was asked to remove the vegetable or fruit from the combination and to place only the vegetable or fruit in the bottle. For instance, if the child had eaten apple pie, the apple filling from a duplicate piece was scraped out and put in the bottle. Foods which were known to contain negligible amounts of ascorbic acid, such as milk, bread, cereals, butter,

cheese, meat, eggs and sugar were not collected because their inclusion dilutes the concentration to such an extent that the subsequent assay is less accurate.

The mother was also asked to record in household measures (cups, tablespoons, etc.) as accurately as possible all the food the child ate during the 24-hour collection period. The food collected was picked up soon after the last meal, which was eaten at noon. At this time the dietitian checked over the food record to make sure that all the foods containing fruits and vegetables had been collected in the manner outlined above. The mother was given 25 cents to cover the cost of this food. In 11 families, the food eaten by 2 children was collected separately. In two-thirds of these cases, one of the children was 7 to 10 years older than the younger child (whose age varied from 7 to 11 years). The meals eaten by the two children varied considerably, as in half of these pairs of children there was a difference of 40 mgm. or more in their intakes of vitamin C. In addition, 37 of the mothers and 2 fathers collected separately in the same way, the fruit and vegetable-containing foods that they had eaten during the same period.

Method of determining vitamin C in foods collected.—The weight of the food plus the metaphosphoric acid was determined in the laboratory and sufficient additional 3% metaphosphoric acid was added to bring the proportions up to 3 parts of food to 7 parts of acid. The mixture was then blended for 2 minutes in a Waring blender. Evelyn's method, using dichlorophenol-indophenol and his photoelectric-colorimeter as modified by Jackson and Drake,² was used for the determination of vitamin C. The amount of vitamin C in the edible portion of the citrus fruits or the citrus or tomato juices was determined in a similar manner.

The age of the subjects.—The age of the subjects is shown in Table II. It is seen that all but one of the children were from 7 to 20 years of age, the majority (85%) being between 7 and 12 years.

VITAMIN C OBTAINED IN THE CANADIAN FOODS EATEN

The amounts of vitamin C per day obtained by 96 individuals from Canadian foods only, is shown in Table III. Seventeen other individuals ate raw or cooked imported cabbage

in addition to Canadian grown vegetables and fruits. Their intakes of vitamin C will be discussed later in the section under imported foods and they are not included in Table III.

TABLE II.
AGES OF SUBJECTS

Ages of subjects	Number of children and adults	Recommended daily allowances of vitamin C—in mgm. ⁵	Percentage of subjects eating daily allowances or more
4-6 years.....	1	50	0
7-9 years.....	37	60	40
10-12 years.....	26	75	38
13-20 years (girls)	3	80	0
13-15 years (boys).....	3	90	33
16-20 years (boys).....	4	100	0
Adults.....	39	70-women 75-men	5

TABLE III.
MILLIGRAMS VITAMIN C PER DAY IN THE
CANADIAN FOODS EATEN

mgm.	Number eating these amounts
0 to 5	27
6 to 15.....	45
16 to 30.....	14
31 to 40.....	9
41 to 50.....	1

CANADIAN FRUITS AND VEGETABLES EATEN AND THEIR EFFECTS ON THE VITAMIN C INTAKE

1. *Potatoes*.—Twelve children and 8 adults, or 20 in all, of the 113 subjects did not eat potatoes during the day of collection. Twelve subjects (2 of them adults) ate potatoes twice during this day. Eight of these 12 individuals ingested 13 mgm. or less of vitamin C in their Canadian foods during the day. The remaining 4 ate cabbage or tomatoes also, which raised their vitamin C intakes. It is obvious therefore that these cooked potatoes at this time of year added very little vitamin C to the diet. The potatoes were served mashed by about 55% of the subjects. Boiled peeled potatoes were served by about 26%, and other methods made up the remainder. Previous investigators have shown that when potatoes are peeled and boiled about 50% of their vitamin C is lost. When they are mashed in addition, a further loss of some 25% occurs.

2. *Turnips*.—Thirteen subjects (12%) ate cooked turnips, usually mashed, two-thirds of them taking servings of 2 to 4 tablespoons in

size. When taken in these generous amounts, the turnips resulted in a definite improvement in the vitamin C intake, as these individuals received from 16 to 39 mgm. of this vitamin in their Canadian foods per day.

3. *Tinned tomatoes and tomato juice*.—Thirteen individuals (12%) ate tinned tomatoes or tomato juice in varying amounts. Their intakes of vitamin C varied from 11 to 44 milligrams per day, including tomatoes in any form.

4. *Apples*.—Forty-six individuals (41%) used apples during the day. Two-thirds of them ate the apples uncooked and the usual amount was 1 apple. Thirteen had applesauce, one had a baked apple and 2 used apple juice (not vitaminized). From studying the vitamin C assays on the Canadian foods eaten, it was evident that apples added very little of this vitamin to the diet.

5. *Carrots, canned peas, canned corn, canned peaches, canned pears*.—These foods were used by many of the families but in 35 samples where these foods were the main fruits or vegetables in addition to potatoes, only 4 contained more than 10 mgm. of vitamin C in the Canadian foods eaten during the day. The four highest ranged from 11 to 14 mgm. Therefore these foods add little of this vitamin to the diet.

VITAMIN C FROM IMPORTED FRUIT AND VEGETABLES

Thirty-seven, or one-half, of the children had oranges, grapefruit or their juices in the day's diet. The amount of vitamin C obtained from these citrus fruits by these children is shown in Table IV. The use of such citrus fruits

TABLE IV.
DAILY INTAKE OF VITAMIN C FROM CITRUS
FRUITS, OR THEIR JUICES

mgm.	Number of children	Number of adults
Under 30.....	2	1
31 to 40.....	4	3
41 to 50.....	4	2
51 to 60.....	10	0
61 to 70.....	3	0
71 to 80.....	4	1
81 to 90.....	4	0
91 to 100.....	5	0
Over 100.....	1	0

raised these children's total intake of vitamin C to between 37 and 178 mgm. Bananas were eaten in addition by several of the children and alone in two cases. In the latter, the total daily

intakes were 20 to 30 milligrams (one and two bananas) respectively.

Only 7 adults (1/6th of them) ate either oranges or grapefruit or their juices. The amount of vitamin C that these foods added to their diet is shown in Table IV. Their total daily intakes of vitamin C varied between 37 and 99 milligrams. The great advantage of including citrus fruits or their juices in the diet is easily seen.

Seventeen individuals ate raw or cooked imported cabbage. Their intakes of vitamin C in Canadian foods plus the cabbage were as follows: 4 ate 11 to 15 mgm., 7 ate 16 to 30 mgm., 5 ate 31 to 40 mgm. and 1 ate 46 mgm. When these figures are compared with those in Table III it is evident that the use of this imported cabbage improves the intake of vitamin C considerably.

TOTAL DAILY INTAKES OF VITAMIN C

The total daily intake of vitamin C of all the subjects is shown in Table V. This of course

TABLE V.
TOTAL DAILY INTAKE OF VITAMIN C

mgm.	Number of children	Percentage of children
0 to 5	12	16
6 to 20	16	21
21 to 30	5	7
31 to 40	3	4
41 to 50	5	7
51 to 60	5	7
61 to 70	4	5
Over 70	24	32

mgm.	Number of adults	Percentage of adults
0 to 5	8	20
6 to 20	23	59
21 to 30	1	3
31 to 40	1	3
41 to 50	2	5
51 to 60	1	3
61 to 70	1	3
Over 70	2	5

includes that obtained from both domestic and imported fruits and vegetables.

It is obvious that far more of the children than of the adults are eating diets containing over 70 mgm. In Table II is shown the percentage of children of different ages who ate the amounts of vitamin C recommended by the Food and Nutrition Board, National Research Council (U.S.A.).⁵ To return to Table V, 16%

of the children and 20% of the adults received less than 5 mgm. The U.S. Food and Drug Administration has set 20 mgm. as the minimum daily requirement of vitamin C for children 1 to 11 years of age. For children over 12 and adults it is set at 30 mgm. Eighty-two per cent of the adults ate less than this amount. Of the children, 39% under 12 years ate less than 20 mgm. and 38% of the children 12 to 20 years ate less than 30 mgm.

SUMMARY

1. The amount of vitamin C eaten in 24 hours by 74 children (85% between 7 and 12 years) and 39 adults was determined by collecting the food as served and assaying it chemically. The income of 70% of these families ranged from \$1,500 to \$2,500 per year (spring 1948).

2. It was found that the Canadian foods (including tomatoes) eaten provided meagre amounts of vitamin C. About 73% of the subjects ate 15 mgm. or less of vitamin C in such foods. Only one individual ate more than 40 mgm. of vitamin C in Canadian foods (44 mgm.).

3. One-half of the children and one-sixth of the adults used citrus fruits or their juices during the day the food was collected. These foods alone added 30 to 100 mgm. of vitamin C to the daily diet.

4. The total daily intake of vitamin C was very low, less than 5 mgm., in 16% of the children and 20% of the adults. In 22% of the children and 62% of the adults the intake was a little higher, ranging between 5 mgm. and the minimum daily requirements laid down by the U.S. Food and Drug Administration (20 mgm. for children under 11 years, 30 mgm. for older children and adults). In other words, a total of 38% of the children and 82% of the adults ate less than the minimum daily requirement. The more generous daily allowances recommended by the Food and Nutrition Board of the National Research Council (U.S.A.) were attained by only 5% of the adults and 33% of the children. The amounts recommended vary from 50 to 100 mgm. for the children, depending on their ages, and 70 to 75 mgm. for the adults.

5. From this study it is evident that a large percentage of the Canadian population during the late winter months eat small amounts of vitamin C.

REFERENCES

1. YOUNG, E. G., SYLVESTRE, J. E., NADEAU, H., PATTERSON, J., MCHENRY, E. W., HUNTER, G. AND PETT, L. B.: *Canad. Pub. Health J.*, 32: 236, 1941.
2. HILTZ, M. C.: *Canad. Pub. Health J.*, 34: 6, 1943.
3. TRUSCOTT, J. H. L., JOHNSTONE, W. M., DRAKE, T. G. H., VAN HAARLEM, J. R. AND THOMSON, C. L.: A Survey of the Ascorbic Acid Content of Fruits, Vegetables and some Native Plants grown in Ontario, Canada, Department of National Health and Welfare, Ottawa.
4. BRANION, H. D., ROBERTS, J. S. AND CAMERON, C. R.: *J. Am. Diet. Ass.*, 5: 420, 1947.
5. WELLINGTON, M. AND TRESSLER, D. K.: *Food Research*, 3: 311, 1938.
6. NOBLE, I. AND WADDELL, E.: *Food Research*, 10: 246, 1945.
7. OLLIVER, M.: *Chem. & Indust.*, 18: 235, 1947.
8. ESSELEN, W. B. JR., LYONS, M. L. AND FELLERS, C. R.: *Mass. Agr. Exp. Sta. Bull.*, 390, 1942.
9. JOHNSTONE, W. M.: *Canad. Hosp.*, 6: 22, 1940.
10. BRANION, H. D. AND CAMERON, C. R.: *Canad. Pub. Health J.*, 38: 283, 1947.
11. Food and Nutrition Board, National Research Council, Washington. Recommended Dietary Allowances, Reprint and Circular Series No. 122, August, 1945.

NOVOCAIN IN ABDOMINAL SURGERY*

H. F. P. Grafton, M.D., D.G.O., F.R.C.S.E.,
M.R.C.O.G.

Irving Clinic, Kamloops, B.C.

THE use of novocain in abdominal surgery is not generally practised, due to ignorance of its possibilities; and to an impression that if used, elaborate methods of blocking sympathetic chains are needed. Actually, its possibilities are great; and the technique of using it is easy and straightforward. Moreover, it provides certain valuable advantages in obtaining relaxation when used to supplement other types of anæsthetic which merit consideration.

The present paper is based on personal experience and observation; and although not statistical, covers many hundreds of cases.

TECHNIQUE

A. General—applying to all abdominal work.

—The drug used in most cases is 1/2% novocain plus adrenalin. Metycaine has also been used successfully. The skin and muscle of the abdominal wall must be adequately infiltrated, either in the line of the incision (and this must be a band sufficiently wide to insert sutures in the anæsthetic area) or as a lozenge shape inclosing the area of incision. In addition, we usually inject extra novocain at three or four points far lateral to the incision deeply in the abdominal muscles. It is important to inject solution into the muscle at either side of the incision (most easily by a fanning-out tech-

nique) to permit good muscular relaxation; but I have found that the extra injections far out on the abdominal wall are very valuable in giving extra relaxation.

As soon as the local injection is finished, skin, fascia and muscle are divided as deep as the peritoneum and bleeders are clamped immediately. A small incision is now made in the peritoneum and through this, about 200 c.c. of 1/2% novocain are poured through a catheter and funnel. This small opening in the peritoneum is now closed with a clamp to prevent escape of novocain. The 200 c.c. of novocain now free in the peritoneum cavity diffuses widely and acts quickly. While this is happening, we go back and tie the bleeders. By this time anæsthesia should be complete. The patient can be placed in the Trendelenburg position if desired; the peritoneum is opened in the usual way and the operation continued. By doing it in this order, there is no need to wait or delay. It is true that the peritoneal cavity can be opened widely and then the novocain poured into the open cavity but this usually wastes a certain amount of solution.

B. Special—additional intra-abdominal procedures suited to particular operations.—(1) Appendix: It is usually worth injecting a few drops of novocain into the meso-appendix. (2) Hysterectomy: Some novocain should be injected between the layers of the broad ligaments laterally. This serves admirably for subtotal hysterectomy. If total hysterectomy is to be done, it is necessary to inject the para-cervical tissues through the vault of the vagina. We always do this before draping the abdomen, with the patient in lithotomy position, using a speculum and tenaculum and long needle. We do this at the same time that we paint the vagina with gentian violet (which latter procedure is always done by us before doing any total hysterectomy) so that injection of the novocain takes only a few seconds of time extra. (3) Gastrectomy: In addition to the general technique and the use of novocain solution in the abdominal cavity we have found that a useful accessory is to inject novocain just beneath the peritoneum of the the posterior abdominal wall in the mid-line, just superior to the transverse meso-colon. The exact position is not important; but enough should be injected to raise a large bleb under the posterior peritoneum of the lesser sac.

* An address delivered at the First Scientific Session of the British Columbia Surgical Society, Vancouver, B.C., September 16, 1947.

This greatly prolongs the duration of the anaesthesia. It is not necessary to use elaborate procedures to inject the sympathetic chain. (4) Bowel resection: or anastomosis, etc. The previous general technique is sufficient. (5) Caesarean: No adrenalin is used lest it inhibit uterine contraction; otherwise standard general method. It is not necessary to inject the uterus. In lower segment section it is necessary to inject under the fold of the bladder peritoneum. (6) Gall bladder: I do not believe it feasible to use local anaesthesia for gall bladder operations. But a valuable accessory to whatever anaesthetic being used, is to infiltrate the subcostal margins deep enough to block the intercostal nerves. This takes but a few moments and completely relaxes the upper abdominal muscles.

PRE-MEDICATION AND PREPARATION

We never mention the term "local anaesthesia" before operation as this invariably produces a vision or recollection of suffering in a dental chair. If she insists on discussing the anaesthetic, we simply say it will not be a spinal and that she will be comfortably asleep. The majority of patients do not know before or after operation that they have had local anaesthesia.

Adequate sedation is just as necessary here as in a spinal anaesthetic. We have used various combinations preoperatively: (a) Morphine, hyoscine and nembutal in combination. (b) Sodium amytal intravenous (Appleby technique). (c) Avertin.

All of these prove adequate and satisfactory in the majority of cases but with all of them there is the possibility that the patient may be restless or noisy or not sufficiently sleepy, so that it may be necessary occasionally to supplement with other procedures such as additional morphine intravenously, ether in small quantities (often only for a very short time) gas-oxygen etc. This is the disadvantage of the method; so we have sought for a more perfect and controllable type of sedative.

We think we have found it in the use of continuous pentothal during operations. Dr. Bruce MacKay has developed this technique by giving only a small amount of sedative preoperatively; then starting a continuous saline infusion into the vein in the operating room; into the rubber tubing of this he can inject

pentothal as required—just sufficient to keep the patient quiet and lightly asleep. Much smaller quantities than the usual anaesthetic amount is required since the novocain provides the anaesthetic. It is rare to need more than 0.5 gm., even in long operations. Rarely do Caesarean sections require more than 0.1 or 0.2 gm. Cyclopropane with oxygen has been used instead of pentothal.

Advantages of local anaesthesia.—Low anaesthetic risk especially for poor risk patients. No nausea or vomiting. No postoperative headache as in spinal. No shock. No poisoning. I will state that in the many cases I have used this technique there has never been the slightest suggestion of novocain poisoning. Excellent muscle relaxation if the muscles are adequately injected. Excellent retraction of intestine. One of the very remarkable features is the way in which the gut contracts and shrinks up (more strikingly even than it does in spinal anaesthesia). We are accustomed to working in the abdomen without packs and without retractors; and the relaxation of both muscles and intestines is so good with this method that we are able to do this. In the usual pelvic operations with the patient in the Trendelenberg position we never see a loop of intestine unless we look for one. Rare post-operative distension.

Disadvantages.—Unless pentothal is used, the sedative does not always prove sufficient and so may require extra sedation or general anaesthesia. Requires more patience and a gentle technique (although from a patient's standpoint this may not be entirely disadvantageous).

Types of successful cases.—Hernia; appendix (if not ruptured); ovarian cyst; hysterectomy (if not obese); there is distinctly less pain in lifting the uterus and pulling the ligaments when novocain is used than is the case with spinal anaesthesia. Bowel resection. Caesarean section. Gastrectomy.

I would particularly stress its suitability in ovarian cyst, hysterectomy and gastrectomy, and Caesarean, in all of which we regard it as the anaesthetic of choice.

Contraindications.—Children and extreme nervousness. Infection (abdominal wall, peritonitis, salpingitis). Blood in the abdomen, as in ectopic. Perforated ulcer. Where there is pulling and dissection of tissue as in Gilliam and frozen pelvis (although we have done a

few cases of adherent tubes, we do not count on it being suitable for this).

As a relaxant in other anæsthetics.—The most striking features in the use of novocain as described above is the beautifully relaxed abdominal muscles and the almost phenomenal retraction of gut. Giving extra anæsthetic does not abolish these advantages; nor does the administration of other anæsthetic first, prevent the surgeon obtaining this relaxation if he uses novocain later. Therefore, regardless of the type of anæsthetic used, it is possible to obtain *extra* relaxation and *extra* retraction over and above that obtained from the original anæsthetic. We have all had cases (especially with ether) with tight muscles and straining guts, where the surgeon has to fight every inch of the way. In the majority of cases, if this condition arises it can be corrected quickly by injecting abdominal muscles with novocain even in a crude way, and pouring a cup full of 1/2% novocain into the abdomen.

The injecting of muscles is particularly valuable in upper abdominal surgery. In cases of distended bowel, even just pouring a cup full of novocain into the abdomen without taking the time to inject muscles, will result in rapid shrinking of gut and will simplify the work of the surgeon. In cases where spinal anæsthetic may have failed, worn off, or proved insufficient the use of local anæsthesia in addition will save the day; or if the surgeon wants still more retraction of bowel than what the spinal provides, he can pour in novocain and get still more retraction of bowel.

If a non-relaxing anæsthetic is used (such as gas oxygen or pentothal) abdominal surgery is difficult unless some additional agent is used to relax the muscle. Curare has been widely used for this purpose at the present time; but novocain provides a simple and safe alternative to curare.

We are now back to the same position we were some time ago having reached there by another route. First we started with novocain as the anæsthetic and concluded that continuous pentothal or gas-oxygen was the ideal sedative to use in association. If we start with pentothal as our anæsthetic, we find novocain an excellent relaxant to supplement it. By whichever argument you arrive, this combination proves safe and satisfactory.

SUMMARY

An attempt has been made to show how novocain can be used as an anæsthetic in a wide field of abdominal surgery. Attention is drawn to its usefulness in providing both muscular relaxation and shrinking of bowel to small size: and it is pointed out that these advantages can be obtained by using novocain as an adjunct to any other type of anæsthetic used in abdominal surgery. It is here that we feel it has its greatest use, as it can be called upon at short notice at any stage during an operation, to provide whatever extra relaxation is required.

TOCOPHEROL (VITAMIN E) THERAPY IN SCLEROSIS OF THE LEGS WITH ULCER*

J. F. Burgess, M.D. and J. E. Pritchard, M.D.

Montreal, Que.

WITH the knowledge that vitamin E complex (mixed tocopherols) exerts a profound influence on the collagenous degenerations (for which the name "collagenoses" seems appropriate), following its use in a case of ulcero-nodular granuloma of the legs compatible with a diagnosis of necrobiosis lipoidica diabetorum,¹ and in lupus erythematosus²—amongst other degenerative processes—our attention was directed toward leg ulcers, because in these cases we were impressed with the degree and frequency with which sclerosis of the legs could be demonstrated both clinically and histopathologically.

The following cases are reported:

CASE 1

P.G., male, aged 50, was admitted to hospital on May 15, 1947, with ulceration of both legs with some surrounding eczematoid dermatitis of three months' duration. There was a history of recurring ulcers over the past year. Under intramuscular injections of penicillin and wet dressings locally he was discharged on May 31, with the ulcers much improved. He also received some insulin by injection because his blood sugar was slightly elevated, although he was not diabetic. Biopsy was made from tissue taken in the ulcer area on May 28. He was re-admitted on June 9, because of recurrence of deeper ulceration and œdema in the left leg and for the purpose of intensive tocopherol therapy. The integument of both legs was thickened and had lost its elasticity particularly in the lower halves.

On June 13, a second biopsy, made in the middle third of the left leg by scalpel, was difficult to approximate because of the obvious impairment of elasticity of the skin, the edges falling apart and persisting as an

* From the Departments of Dermatology and Pathology, the Montreal General Hospital, Montreal.

ulcerative process. Beginning June 11, he was given 200 mgm. of vitamin E complex (tocopherol) by injection every second day and 150 mgm. tocopherol daily by mouth. Penicillin and insulin therapy were given as on his previous admission. Marked improvement occurred and the skin of the leg became progressively and demonstrably more pliable and soft.

A third biopsy was done on July 2 (3 weeks later) in the neighbourhood of the second biopsy, with scalp; the edges were coapted easily and the area later healed without difficulty (Fig. 1). A progress note on July 8 states "Skin of the legs is almost normal in feel—the elasticity of the skin has returned and it can now be picked up". Complete healing occurred and he was discharged on July 13.



Fig. 1. (Case 1).—Biopsy ulcer (lower wound) 3½ weeks after incision. Second biopsy wound (upper lesion) four days after operation, following tocopherol therapy.

First biopsy made May 28, 1947, on tissue removed from the margin of the ulcer showed markedly thickened skin. At one end of the section there was a narrow margin of the ulcer in the floor of which there was indolent granulation tissue composed almost entirely of endothelial cells with numerous closely packed capillary vessels lined by hypertrophic endothelium. There was only moderate exudate of lymphocytes and polymorphonuclears and very little evidence of circulating blood, and no fibroblastic proliferation except at the margin of the ulcer. In the remainder of the section the following distinct features are noticeable (Figs. 2, 3 and 4).

1. Marked acanthosis and hyperkeratosis of the epidermis.

2. A subepidermal zone comprising the zona papillaris and upper margin of the reticularis in which there is a very evident increase in the capillary plexus. Some of these vessels are dilated and filled with blood; others are collapsed and give the impression of sprouting. The lining endothelial cells are hypertrophied. Throughout this zone there is a moderate infiltration with lymphocytes and a few eosinophiles and a proliferation of fixed tissue cells. Some of the collagen bundles appear normal, others are swollen and fragmented. Haemosiderin deposition is quite noticeable.

3. A marked swelling of the collagen bundles in the lower two-thirds of the corium. The capillary vessels in this zone are lined by large endothelial cells and for the most part are collapsed. About them there is mild lymphocytic infiltration and some haemosiderin pigment.

A second biopsy made on June 13, on tissue removed well away from the ulcer shows the same changes in the epidermis and subepidermal zone as in the first biopsy, but in addition there were minute haemorrhages and a

more marked deposition of haemosiderin. This zone merges with a cellular dense fibrous tissue becoming more compacted toward the deep margin of the corium. Coursing through this zone are compressed capillary vessels lined by hypertrophied endothelial cells and about which there is mild lymphocytic infiltration and considerable haemosiderin. There is one isolated area of massively swollen collagen in which there is a small haemorrhage.

From these two biopsies made before treatment the thickening and hardening of the skin can be accounted for by the collagenous swelling, the proliferative fibrosis and inflammatory reaction and to a lesser extent by the acanthosis and hyperkeratosis. The discoloration is due to the deposition of haemosiderin. Of particular note are the vascular changes with escape of blood from which the haemosiderin is derived. It is possible that this pigment plays a part in the provocation of the fibrosis.

A third biopsy (Fig. 5) was made on July 2, on tissue removed from a site adjacent to the second biopsy. The skin compared with the previous biopsies is about half as thick and appears almost normal. There is only slight collagen swelling along its deep margin. The capillary vessels are now inconspicuous and there is only slight perivascular deposits of haemosiderin and lymphocytic infiltration. It is interesting that elastic tissue stains show an abundance of elastica in the zona reticularis ending abruptly at its upper margin with none in the zona papillaris.

CASE 2

D.S., male, aged 59, had been wounded by shrapnel in the lower left leg in 1918 and had a compound fracture. Since then there had been some pigmentation in the area. In 1936 he developed an ulcer in this leg and has since had numerous admissions to the hospital because of recurrent ulcers in both legs. He had had a left saphenous ligation done in 1944. On admission September 2, 1947 both legs were deeply pigmented and a large ulcer of six months' duration was present in the lower third of the left leg which resisted healing. Both legs were obviously markedly sclerosed and hide-bound in their lower halves with scar formation as a result of old ulcers. Amputation of the left leg was considered at this time. A biopsy was made on September 4 and, as in other such cases, the wound broke down to produce a typical leg ulcer (Fig. 6). Over a ten-week period he received 36 injections of vitamin E complex of 200 mgm. each and 600 mgm. daily of tocopherol by mouth. No local treatment was given and he was up and about during this time. There was complete healing and a marked improvement in the softness and pliability of the skin.

Following discharge he was kept on wheat germ and vitamin E complex (100 mgm. daily) and three months' later the skin had lost some pigment and became considerably more pliable, though still obviously sclerosed.

The first and only biopsy (Figs. 7 and 8) was made on tissue taken well away from the ulcer on September 4, 1947. The sections consist of thickened skin covered by a uniform epidermis devoid of rete pegs and covered by a thin layer of keratin. The underlying corium is composed of dense collagen bundles with the exception of a narrow zone at the deep margin where the bundles are markedly swollen as in Case 1. Traversing the fibrous corium are numerous capillaries lined by hypertrophied endothelium. These vessels are mostly collapsed and can be traced into the subepidermal zone where they branch and ramify, forming conglomerates of closely packed vessels which stand out prominently. About them and scattered throughout the corium there is a large amount of haemosiderin. The sweat glands are atrophic. There are no hair follicles. Arteries and veins in the subcutaneous fat are patent and well preserved. Elastica is plentiful in the lower half but absent in the upper half of the corium. The skin in this case of long duration shows vascular changes similar to those in Case 1, but the haemosiderin pigmentation and fibrosis

is much more marked. The epidermis is atrophic. Collagen swelling is seen only as a narrow zone at the base of the corium.

CASE 3

A.J., female, aged 41 had dermatitis of the left ankle with superficial ulceration of four months' duration, with marked sclerosis of both legs so that the skin was no longer pliable, this being more marked in the left leg and involving the lower half of each leg. From June 12, 1947, 100 mgm. vitamin E complex was given daily, together with four injections of 200 mgm. intramuscularly once weekly for four weeks. The skin then became more pliable with healing of all the lesions. This patient was ambulatory throughout and carried on with her work.

CASE 4

J.F., male, aged 65 had a history of an old injury involving the left ankle with marked varicosities in

which he had had ulceration three years' before. An indolent ulcer $1\frac{1}{2}$ " x $1\frac{1}{2}$ " was present over the outer aspect of the left malleolus. From September 18 to October 23 he received five injections of 200 mgm. vitamin E complex (tocopherol) weekly along with 150 mgm. daily by mouth. A moderate degree of sclerosis was present in the lower third of each leg. He showed complete healing of ulcers. He was ambulatory throughout.

CASE 5

G.W., male, aged 72 was admitted to hospital on July 7 and discharged on October 9. There was a large ulcer of the right lower leg, 4" in diameter, of $2\frac{1}{2}$ years' duration. Previous surgical care had been ineffective. There was restriction of movement of the right ankle along with marked thickening and sclerosis of the skin which was hidebound to a marked degree. A radiograph showed "calcification in the vessels of both legs and sub-periosteal new bone formation involving the

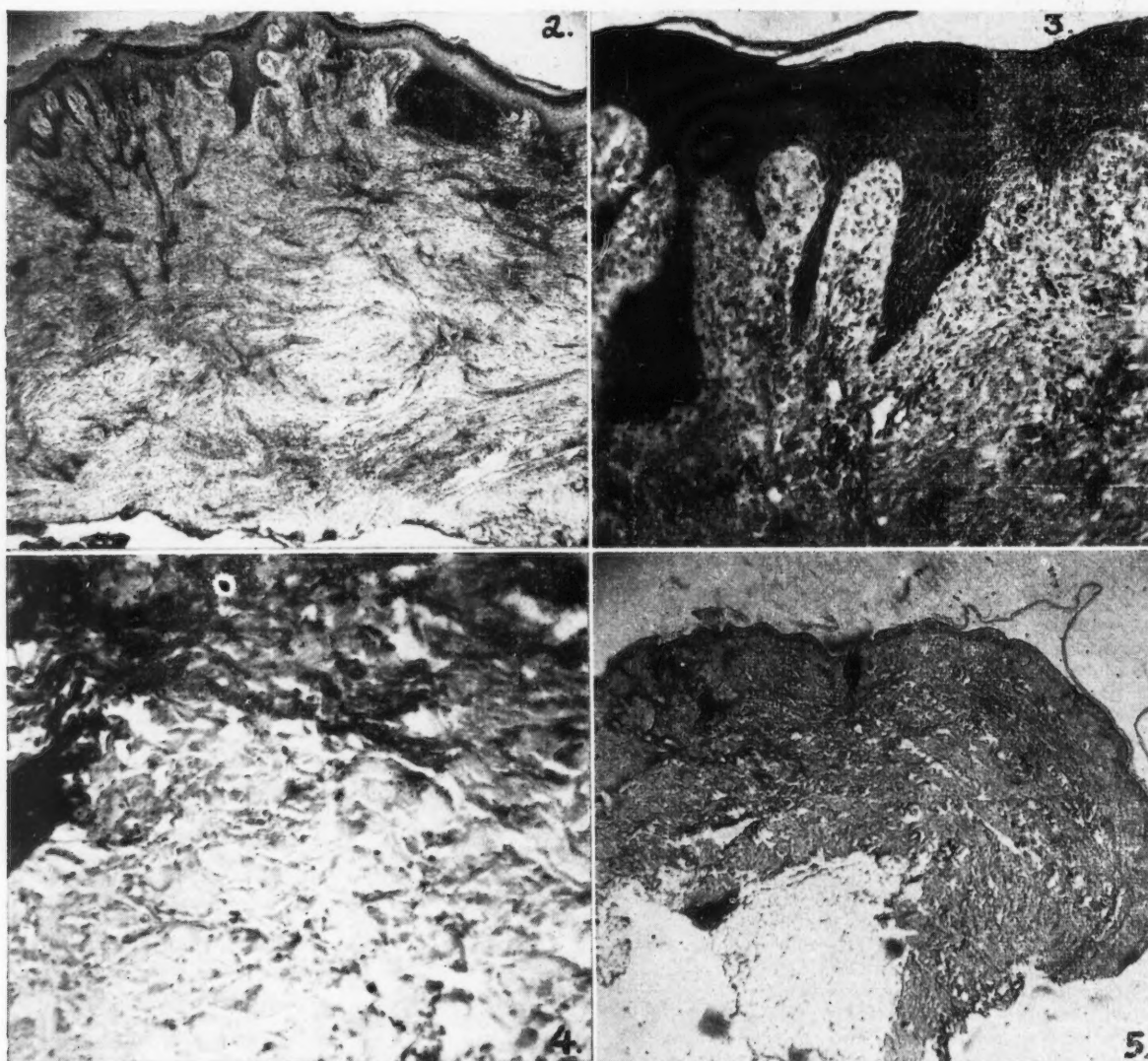


Fig. 2. (Case 1).—Low power of full thickness of section showing the marked sclerosis and thickening of the corium with prominent vascular markings, particularly in the upper part, and the irregular acanthosis and hyperkeratosis. Fig. 3. (Case 1).—Higher power of epidermis and zona papillaris showing acanthosis and the marked vascular proliferation with ectasia, lymphocytic infiltration and fixed tissue cell proliferation. Fig. 4. (Case 1).—High power through upper reticularis. Above is some well-preserved collagen. In the lower part the collagen is markedly swollen. Fig. 5. (Case 1. After treatment).—Same magnification as Fig. 2. The epidermis is normal. The zona papillaris and the reticularis appear about normal except for slight collagen swelling near the base. There is only mild perivascular lymphocytic infiltration. Vascular markings are no longer prominent.

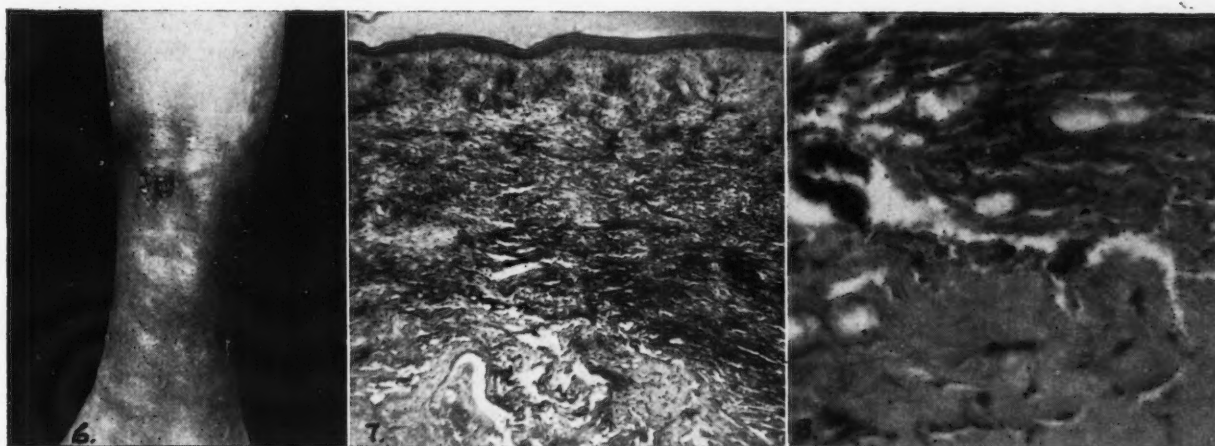


Fig. 6. (Case 2).—Biopsy ulcer, three weeks after operation (outer aspect of left leg).
Fig. 7. (Case 2).—Low power full thickness of section. Epidermis is flattened; the zona papillaris is widened and in it are many congeries of capillary vessels with surrounding lymphocytic infiltration; the reticularis is mostly densely fibrosed and heavily pigmented with haemosiderin. Swollen collagen and a large venule can be seen at lower margin.
Fig. 8. (Case 2).—High power at lower margin of Fig. 8 showing swollen collagen bundles below and fibrosed pigmented reticularis above.

posterior surface of the lower end of the tibia. There was evidence of a periostitis of long-standing and thickening of the soft tissues at this level, with obliteration of the fat space beneath the tendo Achilles."

The one and only biopsy was taken on July 8 through the margin of the ulcer in lower leg. Sections consist of skin without underlying fat. The whole is considerably thickened but only part of skin is included. On the surface are a few adherent shreds of keratin. The zona granulosa layer is two to three cells thick. Over the papillae the epidermis is only four or five cells thick. The rete pegs are greatly elongated and many are bulbous at their lower ends. The papillae are correspondingly elongated and expanded at their upper ends, oedematous and contain many somewhat dilated capillaries lined by hypertrophied endothelium. There is a considerable diffuse infiltration with lymphocytes. The subepithelial zone shows a more marked lymphocytic infiltration and there are many dilated capillaries set at right angles to the surface. Throughout the whole zona papillaris there is a good deal of haemosiderin pigment in phagocytes. Beneath the zona papillaris there is a broad zone of actively proliferating fibrous tissue permeated by capillary type of blood vessels about which there is marked lymphocytic infiltration.

Vitamin E complex (tocopherol) 200 mgm. by mouth daily and 100 mgm. intramuscularly was administered every three days, no other local or other treatment being given. He improved slowly until his discharge from hospital when the ulcer was nearly healed. The ulcer broke down to a moderate degree one month later. Within another month the ulcer had increased in extent and while there was some increased pliability, the effects of treatment were fair only. On re-admission for further treatment the ulcer was much shallower and much less extensive than in his previous admission.

CASE 6

L.D., female, aged 64 had had multiple ulcers of the right ankle of eight months' duration. There was palpable sclerosis of both legs, more marked in the right leg. There was a history of repeated attack of phlebitis in both legs. Under tocopherol therapy, consisting of 150 mgm. tocopherol daily by mouth and 200 mgm. weekly vitamin E complex intramuscularly, for a month, while ambulatory, she improved considerably in that one ulcer healed. She was then admitted to hospital where under increased tocopherol therapy she responded well. Within one month all ulcers healed with scar formation and a palpable increase of elasticity of the skin.

CASE 7

Mrs. P., aged 55, was admitted to hospital on August 19, on account of an acute painful ulcer of the lower right leg. In 1928 there was an ulcer which followed an insect bite in the left leg. Over the past nineteen years there had been recurrent ulceration about every two years for which she has had a great deal of treatment. On admission, a large ulcer was present above the left inner malleolus. The skin surrounding the ulcer showed marked thickening and sclerosis. Cultures showed moderate growth of *Staph. pyogenes* and *P. vulgaris*. Under local compresses and vitamin E complex 200 mgm. intramuscularly every third day, together with 150 mgm. by mouth, she gradually responded. She remained in hospital for two weeks and following this, while ambulatory, was given 200 mgm. tocopherol daily by mouth and 200 mgm. vitamin E complex intramuscularly twice weekly. In two months the ulceration had gone but there was still obviously marked sclerosis. She was then given 600 mgm. tocopherol daily and four weeks later she was very well with a moderate degree of sclerosis remaining. Following increased tocopherol therapy the skin had become much softer and more pliable.

The above cases listed in some detail are a cross-section of 24 hitherto treated cases in many of whom pathological studies have been made.

COMMENT

Leg ulcers, multiple or single, with or without eczematization, occur commonly in the lower third of one or both legs and are not infrequently viewed as "stasis" or "varicose" ulcers, particularly if oedema is present. The above-listed group of cases seems to us to have a common pattern. The association of a more or less sclerotic condition of the legs, in some patients only moderately apparent through "feel", in others the skin being hidebound, resulting in limitation of ankle movements—with or without varicosities and these are often present to a minor degree—together with multiple or single

ulcers of long duration or of frequent recurrence, often callous in type, makes up the clinical picture.

It is our opinion that the primary and important phenomenon probably is a sub-clinical degeneration of the collagenous tissue resulting in an inability of the skin to withstand trauma of no moment to the normal individual. Rather impressive has been the frequency with which biopsy wounds, away from the ulcer, have resulted in an inability to approximate the wound immediately or the frequency with which the area often rapidly enlarged to reproduce an ulcer characteristic of that for which the patient sought treatment. Biopsies were made in most cases on tissue taken a distance away from any ulcerative process. After therapy had been completed, tissues for biopsy were taken close by the site of the earlier biopsy. However, it would seem—presuming that trauma is a precipitating factor of moment—that once infection is introduced in such ulcers this in turn may well further intensify the sclerosing process as the leg having the ulcerative process shows clinically the greater degree of thickening.

Experimental evidence in rats shows that a muscular dystrophy of the lower extremities results after a prolonged vitamin E-deficiency diet. It has been shown that the greatest concentrations of vitamin E occur in the heart, lungs and spleen.³ It seems probable that the muscles of the lower extremities also require large concentrations of vitamin E in order to maintain a relatively high metabolic activity. This may be of importance in the localization predominantly in these areas of sclerosis with ulcer.

The pathogenesis and development of the lesions in these scleroses with leg ulcers seems to be first a collagenous swelling in the corium accompanied by vascular proliferation and often dilatation commencing in the papillary zone and accompanied by lymphocytic infiltrations, diapedesis of red cells from the capillaries and deposition of hæmosiderin pigment. Then there follows a secondary proliferative fibrosis in the corium and the epidermis becomes acanthotic and hyperkeratotic.

The primary collagenous changes are more marked and more extensive in lesions of short duration in the younger individuals, as case 1, whereas the secondary proliferative

fibrosis and the acanthosis and hyperkeratosis predominates in long-standing lesions in older people, *e.g.*, case 2. This may explain why the response to therapy was more rapid in those cases showing lesser degrees of sclerosis. The very common association of excessive pigmentation in leg ulcers with sclerosis, together with the marked deposition of hæmosiderin may well be indicative of vitamin E-deficiency, comparable to the observation of Mason⁴ in vitamin E-deficient rats.

Purposely, the cases treated in hospital were given intensive tocopherol therapy with a view to its evaluation and therefore we excluded in many cases the factor of rest, local dressings or other medication. Antibiotic therapy together with other medical or surgical measures combined with tocopherol therapy would seem to offer the possibility of more rapid cure. It should be noted here that all of these cases were treated simultaneously by the administration of tocopherols both by mouth and parenterally. It seems to us that either route of administration will probably give comparable results, depending on the amount absorbed. Tocopherols in natural oils produce some pain and reaction when given intramuscularly. It is our observation that bed patients have little discomfort but that ambulatory patients do sometimes complain of discomfort about the third or fourth day after injections. It is best given into the gluteus maximus about two or three inches from the crest of the ilium.

In a large number of cases (including other collagenous degenerations apart from those here presented) given intramuscular injections of tocopherols in oil, one case only has shown tumour-like infiltrations, at the site of injection in the muscles, which have persisted over a long period of time. Some cases have temporarily developed infiltrative lesions which have, however, gradually disappeared. In the rat, intramuscular injections of mixed tocopherols result constantly in such infiltrations from which practically 100% tocopherols has been recovered.⁵ It would be wise to discontinue such injections in humans where any permanence of infiltration presents itself. There is further an occasional patient who tolerates fat soluble vitamin E complex by mouth rather poorly, the effect being that of gastro-intestinal disturbances, headaches and marked lassitude. Such cases are very few in number and treatment has had to be discon-

tinued in these or reduced considerably in amount.

Vitamin E complex is of undoubted value in the treatment of sclerosis of the legs with associated leg ulcers. This effect is directed probably entirely towards the regeneration of collagenous tissue, as demonstrated both clinically and histopathologically. It has seemed probable to us that the tocopherols, in exerting this specific effect upon collagenous structure, may inhibit enzymes, such as hyaluronidase, within the cell body, but it is reasonable that this effect may well be linked up to its known anti-oxidant activity as in its "sparing" function on vitamin A or other synergens.³ That the mixed tocopherols have little bactericidal activity is shown by its failure, when applied locally, to control bacterial content in two cases of ulcers. Further, it is not yet possible to indicate whether these results are obtained from the concerted action of the individual tocopherols or whether alpha, gamma, delta or beta tocopherols individually have a specific function.

In moderate cases, a daily dosage of 100 to 300 mgm. of tocopherol by mouth is indicated, whereas in more marked cases a dosage of 600 mgm. of mixed tocopherols gives better results, preferably on an empty stomach and a relatively low fat diet. It would seem logical that a maintenance of tocopherol levels in the tissues is necessary in order to maintain its good health. Therefore it is suggested that vitamin E complex be continued in 50 to 100 mgm. doses daily over a period of time. This might be added to by the administration of non-defatted wheat germ by mouth or, if well tolerated, given without vitamin E complex.

We are indebted to Abbott Laboratories for generous and unlimited amounts of tocopherol or tocopherol with natopherol (contains large amounts of alpha tocopherol and lesser amounts of beta, gamma and delta tocopherols) in these studies.

We are indebted to Mr. Frank Zahalan for technical help and advice in this study.

REFERENCES

1. BURGESS, J. F. AND PRITCHARD, J. E.: *Arch. Dermat. & Syph.* (in press).
2. *Idem*: *Arch. Dermat. & Syph.* (in press).
3. HICKMAN, K. C. D. AND HARRIS, P. L.: *Advances in Enzymology*, 6: 469, 1946.
4. MASON, K. E.: *Essays in Biology*, University of California Press, 1943.
5. HARRIS, P. L.: Personal communication.

SPONTANEOUS PNEUMOTHORAX

C. E. Robinson, M.D. and J. E. Walker, M.D.

*Chest Unit, Shaughnessy Hospital,
Vancouver, B.C.*

THE following 16 cases of spontaneous pneumothorax, observed in a two-year period at this hospital, are presented because this disease constitutes a relatively more common occurrence than might generally be expected. However, due to the fact that medical examination and treatment was easily available to certain service personnel, it might not be unexpected that some cases presented themselves at hospital who might, as ordinary civilians, have borne their complaints at home. This supposition seems more likely when one considers that, in 1943, of the total hospital admissions for the U.S. Army, 873 were for spontaneous pneumothorax.¹

In the minds of many, spontaneous pneumothorax has often been looked upon as occurring in patients suffering from pulmonary tuberculosis; this is being found to be by no means constant nor common. Coope² has drawn attention to the early observations of Galliard in 1888 and 1892, and by Kjaergaard in 1832, on the so-called "benign pneumothorax" occurring in apparently healthy young adults. He states that many patients who develop spontaneous pneumothorax neither have active tuberculosis of the lungs nor do they develop it later.

Spontaneous pneumothorax may be classified etiologically as follows: (1) Benign (simple or idiopathic) spontaneous pneumothorax—Coope's "pneumothorax of the scarred lung". (2) Pneumothorax due to rupture of an emphysematous bulla, occurring in generalized pulmonary emphysema. (3) Pneumothorax complicating active pulmonary tuberculosis. (4) Pneumothorax complicating other conditions including: congenital cyst, superficial pyæmic abscess, traumatic laceration, ruptured oesophagus, malignancy, lung abscess, etc.

GROUP I. BENIGN SPONTANEOUS PNEUMOTHORAX (Cases 1 to 10)

The largest group in this series consisted of cases of benign pneumothorax. There are various theories put forth as to why otherwise healthy persons should, more or less suddenly, develop a pneumothorax. Coope² postulates that in the majority of cases it is due to rupture of a small sub-pleural bulla or "bleb". The formation of these small bullæ is subsequent

to the rupture or splitting of the subserous tissues in a region of scarred and fibrotic lung. The fibrosis may be due to some previous infection such as bronchopneumonia; this may have occurred in early childhood as a complication of measles or whooping cough; or the patient may have had some vaguely recollected "pneumonia", "pleurisy", or other chest illness. Other less common occurrences of this minor lung damage and fibrosis are in association with bronchial asthma, bronchiectasis, or silicosis; it may also follow upon poison gassing.

Leach,³ who reported 129 cases of pneumothorax in young adult males mentions as possible causes: spontaneous rupture of a weakened portion of pleura, tearing of a pleural adhesion, rupture of subpleural emphysematous blebs, interstitial emphysema leading to a subpleural collection and rupture, wearing through of pleura by a natural process of denudation.

Of our 16 cases 10 were classified benign spontaneous pneumothorax. When one considers other figures this seems to be a high number of cases for an average hospital practice. Niehaus,¹ who reported 24 cases collected over a 24-year period, also reviewed the incidence in previous literature; Kjaergaard reported 51 cases seen in a 20-year period in Denmark; Perry, in London, reported 85 cases occurring in 14 years; Blackford saw 15 cases at the University of Virginia, 11 of which were in 5 years; Wilson, at Yale, had 11 cases in 5 years; and Overstern and Lercher reported 58 cases seen in a 20-year period.

The age of the patients in this group varied from 20 to 33 years, with an average of 24.5 years. This corresponds to Leach's³ series of cases from American Army Air Force personnel in which the ages varied 18 to 41 years with an average of 24.8 years.

History.—Two cases (8 and 9) gave a history of antecedent chest illness; Case 8 had "pleurisy" on the affected side about 3 years previously but was not x-rayed at that time. Case 9 had pneumonia "as a child". Six cases (1, 2, 4, 6, 8 and 10) gave a history of measles in childhood, but none of these had any knowledge of chest complications at that time. Two cases (4 and 6) had a known exposure to pulmonary tuberculosis 10 and 11 years previous to their present illness but neither had ever been known to have either a primary or re-infection.

In 7 cases the onset was characterized by a sudden pain in the chest: related to exertion (increased intra-pulmonary pressure) in 2 cases only, present on awaking (? yawning) in 3 cases, and produced by no apparent cause in 2 cases. In the 3 remaining cases the onset of pain was described as gradual over a period of 1 to 4 days and one case complained of pain for about a month before he presented himself at hospital. In two cases the pain was located in the epigastrium or lower substernal region. In another three cases there was radiation into the neck and/or arms. Most cases had dyspnoea on exertion or when lying on the affected side.

Examination.—Five cases had a pneumothorax on the left side and 5 had the right lung collapsed. Other statistics show a slightly higher percentage of collapses on the right side.^{3, 4} There were no bilateral pneumothoraces in this series. The degree of collapse varied from a small pneumothorax, scarcely discernible by x-ray, to almost complete collapse of all lobes. One case developed an effusion demonstrated by x-ray and this was absorbed in a week. Time required for re-expansion of the lung varied from 1 to 7 weeks. Generally speaking, the time required for complete re-expansion was greatest in those cases with the greatest collapse. None of these cases showed any radiological evidence of other significant lung disease. Eight of the 10 cases had a positive reaction to 0.01 mgm. O.T. (intradermal). White blood count and sedimentation rate was within normal limits (2 cases did not have complete blood work done). Seven cases had sputum or gastric washings examined for acid-fast bacilli; all of these were reported negative.

Progress.—The average period of hospitalization was 29.9 days and the indication for allowing the patients up was complete re-expansion of the affected lung. These cases have been re-examined and x-rayed over a period of 9 to 19 months and none have thus far shown any evidence of further chest disease.

GROUP II. PNEUMOTHORAX DUE TO RUPTURE OF EMPHYSEMATOUS BULLÆ

There were 3 cases (11, 12, 13) in which rupture of an emphysematous bulla was thought to be the cause of pneumothorax. Age 49 to 61 years. Average 54.6 years.

History.—Two cases (11 and 13) were admitted to hospital with a tentative diagnosis of coronary occlusion. One case (11) had the onset of the attack featured by pain in the left chest under the nipple, but it later spread to the right chest, shoulder and arm. He was markedly dyspnoëic and apprehensive. Chest x-ray revealed a 50% collapse of the right lung; there was complete re-expansion in 3 weeks. He had 2 recurrent spontaneous pneumothoraces on the same side during the next 5 months. Electrocardiogram tracings did not show any changes indicative of myocardial infarction. The second case suspected of having a coronary occlusion had had a similar attack 10 years previously but was not x-rayed. His cardiogram showed no specific changes. His chest x-ray showed a diffuse fine fibrosis, the cause of which was not specifically demonstrated, and 25% collapse of the left lung. There were large emphysematous bullæ at both apices.

The third case had no chest symptoms, possibly due to the fact that he was at bed rest during the treatment of advanced rheumatoid arthritis and spondylitis. A routine chest x-ray showed a 20% collapse of the right upper lung with emphysematous bullæ at the apices. A review of his chest x-rays for the past 5 years showed 2 previous pneumothoraces both apparently asymptomatic. Schneider and Reissman⁴ in a series of 100 cases of pneumothorax discovered on x-ray examination of army inductees found that 5% were asymptomatic.

Progress.—One patient, who suffered recurrent attacks, which in the presence of a very low pulmonary reserve constituted a considerable danger, was eventually given an artificial pleurisy (using 5 minims of 10% silver nitrate) which has apparently prevented any further attacks. Two of these cases are not employable, one due to marked pulmonary emphysema, and one due to arthritis. The remaining case is employed at light work.

GROUP III. COMPLICATION OF PULMONARY TUBERCULOSIS (Cases 14 and 15)

History.—Both these cases (ages 59 and 61) had long histories of bilateral pulmonary tuberculosis, with positive sputum. The first case (14) developed a left spontaneous pneumothorax as a postoperative complication follow-

ing the removal of a tuberculous kidney. Chest x-ray showed a 50% collapse of the left lung. He subsequently developed a small pleural effusion, which did not reveal any acid-fast bacilli on culture; the effusion was absorbed in 4 to 5 weeks. The lung completely re-expanded in 3 months. This patient eventually died in hospital and post-mortem examination revealed far advanced pulmonary tuberculosis with cavitation of the left lung, and tuberculous enteritis (as well as a tuberculous kidney, previously removed, and cystitis).

The second case (15) was admitted with severe respiratory distress and was found to have a hydro-pneumothorax on the right side. The air was apparently absorbed in 1 week, but the effusion persisted for 5 to 6 months. Examination of this fluid did not reveal any acid-fast bacilli on culture. This case was thought to have pulmonary emphysema secondary to long-standing tuberculosis and the pneumothorax may, in fact, have been due to the rupture of a bulla, rather than the breakthrough of a tuberculous lesion.

GROUP IV. OTHER CAUSES

(1 case [16], aged 39)

History.—At a routine preoperative examination while patient was serving in the army, this man complained of some dyspnoëa which had gradually developed over a 2-month period, accompanied by some right chest pain. He was found to have a hydro-pneumothorax on the right side. He was treated conservatively over a 20-month period and was aspirated several times, with the eventual re-development of hydro-thorax or hydro-pneumothorax. Pleural fluid, sputum and gastric washings were negative on examination for acid-fast and other pathogenic organisms. He was finally submitted to exploratory thoracotomy, at which a broncho-pleural fistula was found in the lower anterior portion of the right upper lobe. This segment of lung was resected and there has been no recurrence of the trouble a year later. (Possibly this patient had a benign spontaneous pneumothorax initially with a persistent broncho-pleural fistula).

SUMMARY

1. Sixteen cases of spontaneous pneumothorax are reported. It is thought that due to the nature of the institution and medical services more cases are discovered than might be diag-

nosed in ordinary civilian practice; nevertheless, it is a rather high incidence of the disease for general hospital admissions.

2. A brief review of the etiology of the disease is presented, stressing the occurrence of pneumothorax in otherwise healthy adults.

3. Pneumothorax occurred on either side with equal frequency; other statistics show a slight prevalence on the right side, but no explanation has been offered.

4. In two patients or 12.5% there was definite recurrence of spontaneous pneumothorax; in two other cases there was a suggestive history.

5. In the benign cases, the time required for re-expansion of the lung varied roughly according to the degree of collapse, this is as might be expected in persons with otherwise normal lungs and pleura if the site of rupture does not remain persistently patent.

TABLE I.

No.	Name	Age	Past history	Activity and symptoms at onset	Degree collapse	Time re-expansion
1.	D.H.I.	24	Measles	Leaning over desk sudden pain left chest, up neck and down left arm; dyspnoea	25% left lung	2½ weeks
2.	D.C.B.	23	Measles	Walking—sudden pain left chest. Dyspnoea	50% left lung	3 to 4 weeks
3.	R.L.L.	22	Nil	Fell and landed on sacrum; pain left chest, up neck and down left arm; dyspnoea and palpitation	Slight collapse at left apex and mediastinum	2½ weeks
4.	D.E.C.	20	Measles. F. died of pul. tb. when pt. 10	Bending to lift sudden chest pain	Slight collapse upper lobe right 50%. right middle and lower lobes	6 to 7 weeks
5.	T.H.B.	26	Nil	Onset of symptoms on awaking; epigastric pain; dyspnoea	85% right lung	6 weeks
6.	R.M.	33	Measles Contact at 22 with aunt who had pul. tb.	Activity not related. Sudden onset low sub-sternal pain and dyspnoea	40% right lung. Air removed before admission	6 to 7 weeks
7.	L.F.M.	23	Nil	"Pleurisy"—1 month—with radiation of pain to shoulders	15% left lung	3 weeks
8.	J.M.R.	31	Measles. "pleurisy" 4 yrs. before	Symptoms on awaking; pain right chest on coughing or deep breathing	Almost complete collapse right lung	5 to 6 weeks
9.	R.S.W.	22	Pneumonia	Activity not related; pain right upper chest, neck and down right arm	10% collapse right lower	1 week
10.	F.J.M.	20	Measles	Symptoms on awaking; pain left chest; and dyspnoea	40% collapse left lung	4 weeks
11.	H.L.	61	Pulmonary emphysema	Increasing dyspnoea 3 years. Anterior chest pain 5 days with sudden onset	1. 50% right lung 2. 20% " " 3. 15% " "	3 weeks 10 days 2 weeks
12.	R.C.	54	2 previous spon. pneumothorax	Asymptomatic—bed patient	20% left lung	Not known
13.	E.S.	49	"Chronic bronchitis". Not x-rayed	Decreasing exercise tolerance 20 years. Sub-sternal and left chest pain; severe dyspnoea—sudden onset	25% left lung	6 weeks
14.	D.M.	59	Bilateral pul. tb. several years. tb. kidney	Postoperative—severe pain left chest; dyspnoea	50% left lung	3 months
15.	J.M.B.	61	Bronchitis 30 years. Repeated pleural effusions	Gradual onset—pain right chest; dyspnoea and fever	Partial right lung	1 week
16.	B.W.	39	Nil	Pain right chest—dyspnoea 2 months	Hydropneumothorax right recurrent	20 months

6. The possibility of mis-diagnosing an acute myocardial infarction, when pneumothorax occurs in an older patient, is pointed out. Careful physical examination is necessary, often augmented by special diagnostic procedures, in order to arrive at the correct diagnosis.

7. Only two cases of this series, or 12.5% occurred in persons suffering from pulmonary tuberculosis; both of these were in the far-advanced and active stage and in one of these there was evidence to suggest that the pneumothorax resulted from rupture of a large emphysematous bulla.

8. One case of recurrent pneumothorax was treated by induction of a chemical pleurisy, with apparently satisfactory results.

9. One patient who had a persistent hydro-pneumothorax associated with a broncho-pleural fistula was cured by surgical means.

REFERENCES

1. NIEHAUS, R. F.: *Am. J. Roentgenol. & Radium Therapy*, 57: 12, 1947.
2. COOPE, R.: *Diseases of Chest*, E. & S. Livingstone, 1944.
3. LEACH, J. E.: *Arch. Int. Med.*, 76: 264, 1945.
4. SCHNEIDER, L. AND REISSMAN, I. I.: *Radiology*, 44: 485, 1945.

PTERYGIUM COLLI AND ALLIED CONDITIONS

H. O. Foucar, B.A., M.D., F.I.C.S.

London, Ont.

IN 1931 a theological student aged 19 years presented himself for advice concerning curious bilateral folds of skin running from the mastoid region to the point of the shoulder. These were thin, consisting apparently only of skin and some subcutaneous tissue. They were lax and could easily be pulled out from the neck as a web. The ears were large. The hair-line posteriorly was low although there was no actual shortening of the neck and no limitation of movement. No x-ray study was made. The chin receded somewhat and there appeared to be some looseness of the skin below the chin.

This was a new anomaly to me and I could find no description of it, so called it merely a congenital abnormality of the cervical subcutaneous tissue and skin. It occurred to me that the condition could be improved by elliptical excision of skin posteriorly. In 1934 the patient returned for operation and I found it necessary to modify the plan. An incision about 3" long

was made in the midline posteriorly and the skin was undercut. This was not sufficient. A second incision about 5" long was then made transversely at the top of the first incision forming a "T". Each flap of skin was raised and pulled upwards and inwards until the skin folds were obliterated as in operations for removal of wrinkles. The excess skin was excised leaving a triangular defect. The skin edges were then sewn together in the form of a "T". It will be noted that the scar was posterior and well hidden by the hair or collar. Both folds were corrected through the one operative field and it was possible to obtain symmetry easily.

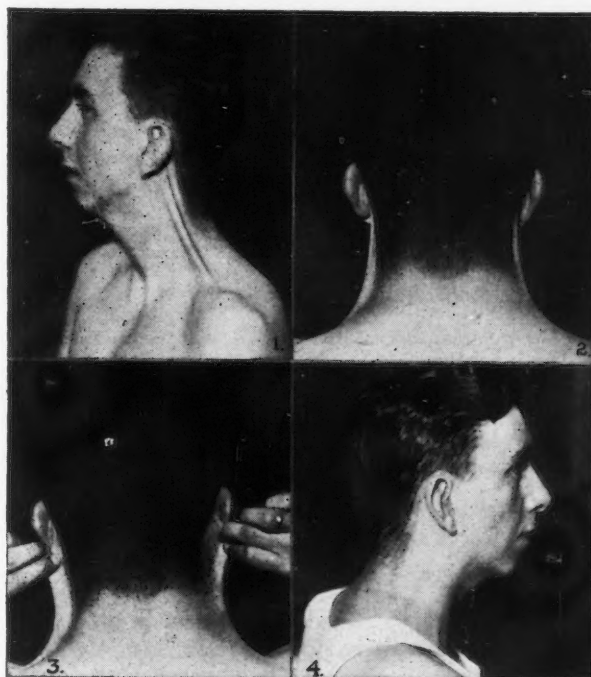


Fig. 1.—Pterygium colli or webbed neck: lateral view. Fig. 2.—Posterior view showing folds of skin and low hair-line, giving the appearance of shortness to the neck. Fig. 3.—Posterior view showing laxness of the skin. Fig. 4.—Lateral view after operation showing complete obliteration of the fold. Note also the inconspicuous scar posteriorly.

It was thought that there might be some deficiency in elastic tissue in the skin but histologic examination was inconclusive, because the specimen came from the back of the neck and not from the sides where the anomaly occurred.

More recently I came across a short description in Babcock's³⁹ *Surgery* in which the name "pterygium colli" was used. This served as a lead for a review of the literature with special reference to etiology, pathology and treatment. Some difficulty was experienced because of the different terms used.

Kobylnski¹ (1883) was the first to describe webbing of the skin on the lateral aspects of the neck and suggested its possible relationship to congenital short neck. Sutton² placed web-like expansions in general among the instances of spurious atavism. He regarded them as spontaneous variations or "sports". The term "pterygium colli" was first applied by Funke⁶ in 1902 to this anomaly seen in a 15 year old girl. It was associated with abnormalities of the breast and nipples and with the absence of pubic and axillary hair. In the same year Bussière⁷ reported webbing of the neck in a Hindu boy aged 12 years. Ballantyne⁸ thought that the web-like structures found passing between various parts of the body might be of the same nature as feto-fetal bands or amniotic adhesions. These expansions, to which the name patagium might be applied, sometimes passed from the neck to the shoulder on one or both sides. He felt that, while the patagium might not be amniotic in origin, it was sometimes found associated with malformations which were generally regarded as such.

In 1912 Klippel and Feil¹¹ described another syndrome which consisted of synostosis of some or all of the cervical vertebræ associated with cervical spinæ bifida and in which a shortened hair-line and limitation of movement produced an appearance not unlike that of pterygium colli. Hutchinson⁴ actually demonstrated the first specimen of this in 1894 and Clarke¹⁰ the first clinical case in 1906.

A case was reported by Drachter³¹ in 1923 in which webbed neck ("dove neck") was found. The presence of a suboccipital encephalocele, however, suggested a diagnosis of Klippel-Feil syndrome rather than pterygium colli. Frawley¹⁴ reported webbed neck in two sisters 12 and 16 years of age, in a woman of 28 and in a girl of 7 in whom there was also webbing of the axillary folds. X-ray examination was negative.

Sections of the folds of the neck obtained at autopsy were studied by De Bruin.¹⁵ They revealed muscle and suggested an abnormal distribution of the platysma myoides. The deep fascia and muscles were not involved. Ullrich¹⁶ stressed the combination of multiple abnormalities. Nageotte-Wilbouchewitz¹⁹ believed the condition to be one of pure atavism and remarked that it occurred naturally in the chimpanzee. One case associated with elephantiasis was reported from Helsinki by Rantasalo.²⁰ This was

a female infant with a thick fold of skin from the mastoid process to the acromial process on both sides. One arm was slightly thickened and both legs and feet were markedly and symmetrically thickened. He stated that pterygium colli was rare and belonged to the same class as folds of the axilla, elbow, fingers and knees. Elephantiasis congenita lymphangiectoides was also very unusual. Only two cases have been reported in which the two conditions occurred in the same individual. He also discussed mongolism in this connection. Hoffman²¹ in 1937 reported three cases and also stressed the combination with other malformations. He felt that it bore some relationship to mongolian idiocy and to the Klippel-Feil syndrome. Two more cases were added by Chandler²² and he referred to the differential diagnosis from Klippel-Feil syndrome and also from Sprengel's deformity. He discussed the surgical correction by means of plastic procedures especially those of the "Z"-plasty type and described in detail his modification of the latter. Marquardt²³ described one case of folds involving the legs and two cases involving the neck. Until now these had been treated according to the principles of plastic surgery. He thought, however, that this could usually be avoided by bloodless orthopaedic measures.

Turner²⁴ in 1938 described a syndrome consisting of the triad, infantilism, webbing of the skin of the neck and deformity of the elbow (cubitus valgus). He reported seven female patients all of whom presented osseous and sexual retardation similar to that associated with hypopituitarism or the Lorain-Levi type of dwarfism with retardation in growth and sexual development. The cervical vertebræ were normal but the neck appeared short because of the webbing and the low hair-line posteriorly. He specifically mentioned that mental retardation and other abnormalities were not present. Treatment with pituitary growth hormones was unsatisfactory. Definite genital development followed administration of anterior pituitary gonadotropic hormone in two cases.

By 1938 MacCollum²⁵ found that approximately 20 patients had been described. He approached the problem from the standpoint of embryology. During the early weeks of fetal life the neck was difficult to distinguish from either the head or shoulders as the diameters of all three structures were very nearly the same.

As the branchial arches grew ventrally to form the lower face and anterior portion of the neck and as the limb buds began to develop the neck became a definitely recognizable structure. Its actual length, however, was almost negligible as the cervical flexure of the fetus placed the chin against the thorax and that portion of the head which would become the mastoid process remained almost continuous with the shoulders. As the fetus continued to develop the head grew more rapidly than the rest of the body so that in the 2nd or 3rd month of pregnancy it had become over one-quarter or one-third wider than the shoulder girdle. Observations made at this period revealed that the neck was quite long on its dorsal surface because of the cervical flexure. It was found to be even longer on the ventral surface because of the medial ingrowing of the branchial arches. It is to be particularly noted that there was very little length to the neck on both its lateral surfaces and that the region of the mastoid process was likely to be either lateral to or in direct vertical line with the region of the acromial process. If, at this time, there was a failure of normal development it was possible for the skin over the lateral surfaces of the neck to remain shortened. As the body grew and the shoulders assumed their normal width, the skin would be even more deficient so that tight bands or webs would form between the acromion and mastoid, the two points which were so closely approximated in early fetal life. He studied four cases and several fetuses and advised the "Z"-type plasty but enumerated several precautions.

Bizzarro²⁶ felt that there was a definite relationship between the congenital high scapula (Sprengel³ 1891) and congenital short neck (Klippel and Feil¹¹ 1912). In both conditions there may be absence of the vertebrae or anomalies in their number or malformed or anomalous ribs. Brevicollis, it seems, is an advanced stage of high scapula. In both conditions the descent of the shoulder girdle is incomplete. Further, bilateral high scapula may show a lowered scalp hair-line and therefore a relatively short neck; it also displays a webbed wing-like neck as in brevicollis. The limitation of the facial expression among frog-necked people may be the result of endocrine dysfunction for in some the expression is quite cretinoid. He reported the case of a

boy aged 14 years. The main features were the expressionless mongoloid face, the lowered nape line, the high level of the scapulae and the short neck. Radiograms showed the cervical vertebrae normal in number and shape except for the slight cuneiform appearance of the third. He had bilateral undescended testes and no pubic hair but no changes in the elbows. He was given gonadotropic hormone, pituitrin and thyroid extract without improvement. It was suggested that later a plastic operation (after Gillies) might improve the contour of the neck. Bizzarro felt that this case was a link between two separate conditions. Clinically it could be classified either as an elementary form of Klippel-Feil syndrome or an elaborate form of congenital high scapula. I feel that this case is even more interesting. The diagnosis of Klippel-Feil syndrome rests only on the shape of the third cervical vertebra. I submit that the diagnosis of pterygium colli with high scapula should be entertained. In addition, this patient showed evidence of infantilism and only lacked cubitus valgus to be considered an example of Turner's syndrome. This case exemplifies the merging of some features of four clinical entities.

Sharpey-Schafer and Schrire^{28, 29} reported that urinary creatinine excretion in a case of Turner's triad was normal. They injected pituitary thyrotropic extract and caused a rise in temperature and pulse rate on the sixth day. The thyroid became enlarged and tender and the basal metabolic rate rose to 43%. Sharpey-Schafer³⁰ treated with testosterone propionate a similar patient who had had hot flushes for four years. Three doses of 50 mgm. each stopped the flushes. The dose was raised to 100 mgm. daily and the flushes remained absent. Sylvester³² described one case of pterygium colli in a boy of 16 years who also presented an abnormality of the patella and Thiemann-Fleischner's disease of the proximal epiphyses of the second phalanx of both middle fingers. In 1940 Capurra³³ reported the first case of Turner's syndrome in South America. Hauptman and Thannhauser³⁵ described an entirely different heredo-familial entity in which the "webbed neck" was produced by tension of the shortened trapezius.

Gilmour³⁶ advanced the hypothesis that the Klippel-Feil syndrome is merely a mild form of the deformity characteristic of iniencephaly.

Iniencephaly is a deformity found only in still-born and in infants who die shortly after birth. The majority are female. There is great retroflexion of the head so that the face looks upwards and forwards. The head is commonly enlarged. The neck is absent or only indicated anteriorly below the chin. The scalp becomes continuous with the skin of the lower part of the back perhaps as far down as the sacral region. The skin of the face usually passes directly on to that of the chest. The scapulae are pushed aside by the head and are laterally situated. The shoulders become more anterior than normally. The bony abnormality is in the occiput, the cervical column and a variable length of the spine below this. Klippel-Feil syndrome or congenital brevicollis consists of shortness of the neck, a low hair-line posteriorly and limitation of movement associated with fusion of the cervical vertebrae and sometimes also of the upper thoracic vertebrae. Since the publication of Klippel and Feil, cases have been described which have the same anatomical lesion but differ in being without any external manifestations. Many additional features, however, have been recorded. Common among the latter are webbing of the neck (pterygium colli), marked depression at the nape of the neck, congenital high scapula, winged scapula, facial asymmetry, spasm of the cervical muscles or torticollis, cervical ribs, absence or fusion of the ribs, scoliosis and dorsal kyphosis.

Sharpey-Schafer³⁷ in 1941 gave the post-mortem findings in a case presenting Turner's triad. She was a woman aged 21 years who had died of tuberculosis. The web of the neck consisted simply of a fold of skin without muscle. No functioning ovarian tissue was distinguishable. The endometrium was destroyed by tuberculosis. The pituitary, thyroid and adrenals were not abnormal.

Flavell³⁸ reported the first case of Turner's syndrome in a male aged 21 years. He was of normal intelligence and a little below average in physique. From the posterior aspect of both auricles a ridge of skin and subcutaneous tissue curved back to the mastoid process and passed thence in a bold web with a gentle concavity down to the region of the acromion. The web could be taken between the fingers and flapped about. Down the whole length of the right web was a linear scar made by exploration

carried out when the patient was three years old. The facial skin was drawn taut and the angles of the eyes, nose and mouth were pulled downwards. The chin was receding and also had the appearance of being drawn back by tight skin. By contrast, the skin of the nape of the neck was loose and redundant. The hair-line was low. There was no real shortening of the neck but the base appeared wider than is normal. Definite cubitus valgus was present, the carrying angle of the forearms being 25 instead of 15°. The beard was scanty. There was no hair on the chest or axillae. Pubic hair was of the female distribution and his hips were wide. The testicles were hypoplastic but the patient said that he had normal erections. Some kyphoscoliosis was present and he had third degree bilateral claw feet. X-ray examination showed failure of union of the 5th cervical neural arch. The family history was negative. Chandler's "Z"-type plastic operation was performed on the left side. On the right side the scar and skin from the posterior edge was excised until the normal neck contour was restored.

In 1946 Bettman reported four patients having webbed neck and two with webbing of the axillary region. He mentioned that the entire ear may be pulled down and the lobe webbed or the ear may be otherwise malformed. The web may be attached in front of or behind the ear or may be in front of one ear and behind the other.

He described an operation which he performed under local anaesthesia. The head was pushed to the opposite side and an incision was made along the length of the prominent ridge down to the muscular layer. A second incision one inch and a half or more was made at right angles to the first on the tensor side of the wound and a third on the opposite side. Usually these two right-angled incisions were made in the region of the one-third and two-third points of the length of the primary incision, one anteriorly and one posteriorly. The skin was undermined and the head abducted further to the opposite side. The point of one flap of skin automatically fell into the angle of the opposite incision.

SUMMARY

Pterygium colli, while rare, is widely distributed geographically. It does not appear to be hereditary but has been reported in two sisters. Possibly the retardation in sexual development noted in some cases cuts short the line and the appearance of advanced cases does not make them very attractive as mates. In its simplest form it consists of a bilateral fold of skin arising from the mastoid region but occa-

sionally from in front of the ear and extending to the shoulder. Usually it is thin but may be thick and can be picked up and stretched from the side of the neck. It consists of skin and subcutaneous tissue although it has been suggested that there may be some abnormality of the platysma myoides. The deep fascia and muscles are not affected. It is possible that there may be some deficiency in elastic tissue but there is no histologic evidence for this. The hair-line is low posteriorly, giving the appearance of a short wide neck. The cervical vertebrae are normal and there is no impairment in movement. In most instances there is no mental retardation but in some cases the condition suggests mongolism.

Rarely, however, does it occur as simply as this but is associated with a wide variety of malformations. Because of its association with these anomalies it is suggested that it is the result of faulty development of the neck and is thus related to iniencephaly, Klippel-Feil syndrome and Sprengel's deformity and that the signs of these may overlap. Turner described a special subvariety exhibiting the triad, infantilism, webbing of the neck and cubitus valgus occurring in women. It has also been reported in a man. Endocrine deficiency, when present, may be regarded as secondary to the underlying congenital defect and not as a primary cause of the condition. Endocrine therapy has not benefited growth but has caused some improvement in the genital symptoms. In most reports there is no mention of treatment of the defect. One author suggested a bloodless orthopaedic procedure. The only surgical techniques actually described were modifications of the "Z"-type plasty. General reference was made to other plastic methods without elaboration.

A technique is now described which is simple and has the advantage of controlling both sides through a single operative field and leaving the scar in an inconspicuous place. While it is admitted that this case was not as advanced as many, it is suggested from a study of the published illustrations that this technique will give better results than the "Z"-type plasty. The lengths of the incisions naturally will vary and in extreme cases it might be necessary to repeat the procedure, if sufficient improvement could not be obtained at the first operation, on the same principle as the so-called French method of scar removal.

REFERENCES

1. KOBYLINSKI, O.: *Arch. f. Anthropol.*, 14: 343, 1883.
2. SUTTON, J. B.: *Evolution and Disease*, Walter Scott, London, 1890.
3. SPRENGEL, O. G. C.: *Arch. f. klin. Chir.*, 42: 545, 1891.
4. HUTCHINSON, J.: Quoted by Rechtman, A. M., and Horwitz, M. T., *Am. J. Roentgenol.*, 43: 66, 1940.
5. LEWIS, H. F.: *Am. J. Obst. & Gyn.*, 35: 11, 1897.
6. FUNKE: *Deutsche. Ztschr. f. Chir.*, 63: 162, 1902.
7. BUSSIÈRE, J. A.: *Ann. d'hyg. et de med. Colon.*, 5: 686, 1902.
8. BALLANTYNE, J. W.: *Manual of Antenatal Pathology and Hygiene—The Embryo*, Wm. Green & Sons, Edinburgh, 1904.
9. ABBOTT, M. E. LOCKHART, F. A. L.: *J. Obst. & Gyn. Brit. Emp.*, 8: 236, 1905.
10. CLARKE, J. J.: *The Lancet*, 2: 1350, 1906.
11. KLIPPEL, M. AND FEIL, A.: *Nouv. Iconogr. de la Salpetriere*, 25: 223, 1912.
12. Idem: *Bull. et mém. Soc. Anat. de Paris*, 6s, 14: 185, 1912.
13. DRACHTER, R.: *Klin. Wchnschr.*, 2: 664, 1923.
14. FRAWLEY, J. M.: *Am. J. Dis. Child.*, 29: 799, 1925.
15. DE BRUIN, M.: *Am. J. Dis. Child.*, 36: 333, 1928.
16. ULLRICH, O.: *Ztschr. f. Kinderh.*, 49: 271, 1930.
17. BAUMAN, G. L.: *J. Am. M. Ass.*, 98: 129, 1932.
18. ROEDERER, C.: *Bull. Soc. de pédiat. de Paris*, 31: 255, 1933.
19. NAGEOTTE-WILBOUCHEWITCH, M.: *Bull. Soc. de pédiat. de Paris*, 32: 683, 1934.
20. RANTASALO, V.: *Acta. Paediat.*, 18: 368, 1936.
21. HOFFMAN, H.: *Arch. f. Kinderh.*, 110: 1, 1937.
22. CHANDLER, F. A.: *Am. J. Dis. Child.*, 53: 798, 1937.
23. MARQUARDT, W.: *Ztschr. f. Orthop.*, 67: 379, 1938.
24. TURNER, H. H.: *Endocrinology*, 23: 566, 1938.
25. MACCOLLUM, D. W.: *New England J. Med.*, 219: 251, 1938.
26. BIZZARRO, A. H.: *The Lancet*, 235: 828, 1938.
27. TURNER, E. L., SHOULDER, H. S. AND SCOTT, L. D.: *Am. J. Roentgenol.*, 40: 43, 1938.
28. SHARPEY-SCHAFER, E. P. AND SCHRIRE, I.: *Clin. Sc.*, 4: 185, 1939.
29. Idem: *Quart. J. Med.*, 8: 195, 1939.
30. SHARPEY-SCHAFER, E. P.: *The Lancet*, 1: 161, 1940.
31. RECHTMAN, A. M. AND HORWITZ, M. T.: *Am. J. Roentgenol.*, 43: 66, 1940.
32. SYLVEST, O.: *Ugesk. F. Laeger.*, 102: 1270, 1940.
33. CAPURRA, A. M.: Tesis de la Facultad de Ciencias medicas de Buenos Aires, 1940.
34. BELGRANO, C. AND CAPURRA, A. M.: *Semana Med.*, 1: 644, 1941.
35. HAUPTMANN, A. AND THANNHAUSER, S. J.: *Arch. Neurol. & Psychiat.*, 46: 654, 1941.
36. GILMOUR, J. R.: *J. Path. & Bacteriol.*, 53: 117, 1941.
37. SHARPEY-SCHAFER, E. P.: *The Lancet*, 241: 559, 1941.
38. FLAVELL, G.: *Brit. J. Surg.*, 31: 150, 1943.
39. BABCOCK, W. W.: *Principles and Practice of Surgery*, Lea and Febiger, Philadelphia, 1944.
40. BETTMAN, A. G.: *Plastic & Reconstructive Surg.*, 1: 205, 1946.

KIRSCHNER WIRE FIXATION IN FRACTURES OF THE CLAVICLE*

Chas. B. Ripstein, M.D., C.M., F.R.C.S.[C.]

Montreal, Que.

FRACTURES of the clavicle are extremely common, but there is no method of treatment which has found universal acceptance. This suggests that none is wholly satisfactory. The majority of cases are treated conservatively and despite inadequate reduction and immobilization firm bony union usually occurs.

There is, however, a small group in which open reduction and fixation is necessary for a good result. The indications for operation may be listed as follows: (1) Oblique fractures of

* From the Department of Surgery, Royal Victoria Hospital, Montreal, P.Q.

the middle third with marked displacement, in which reduction cannot be maintained. (2) Fractures of the outer third which present the same problem as acromio-clavicular dislocations. (3) Any fracture in which a perfect cosmetic result is particularly desired. (4) Cases in which immobilization of the arm would impose a severe economic handicap.

Many methods of fixation have been suggested. Plating is difficult because of the size and shape of the bone and its subcutaneous position. Intramedullary wire fixation was first advocated by Murray in 1940. He recommended a closed reduction and the wire was introduced into the medullary cavity at the lateral end of the bone and made to traverse the fracture line blindly. This method has yielded excellent results in a large series of cases, but it is not without danger and in comminuted fractures reduction may be difficult. Murray also suggested an alternative procedure in which the fracture was exposed and the wire driven outward along the medullary cavity of the lateral fragment and then reversed and drilled back into the medial fragment. This method was suggested to the writer by Dr. L. H. McKim who had used it in several cases. It has proved to be so simple and free from complications that it was adopted as a routine. The present technique has been used in 11 cases with satisfactory results in all.

TECHNIQUE

The patient is placed on his back with a sand-bag beneath the scapula so as to raise the posterior aspect of the affected shoulder above the table. Light nitrous oxide, cyclopropane or pentothal anaesthesia may be used. The procedure only takes 15 minutes and no great relaxation is necessary.

A one-inch incision is made over the site of the fracture. It is placed low to avoid adherence of the skin to the subcutaneous surface of the bone. The platysma is divided and the fracture exposed. After cleaning out blood clot and any soft tissues between the bone ends, the lateral fragment is lifted out of the wound and held firmly in bone-holding forceps. A large Kirschner wire is then introduced into the medullary cavity of the lateral fragment and drilled along the canal until the point of the wire emerges through the skin at the

postero-lateral aspect of the shoulder. There are no important structures which may be injured by this maneuver. The protruding wire is then grasped and withdrawn through the skin until the medial end lies flush with the fracture line. The two fragments are then accurately aligned in position and held. The drill is attached to the projecting lateral end of the wire and it is driven back so as to enter the medullary cavity of the medial fragment traversing the fracture line. The wire is driven into the medial fragment for a distance of 2 inches which is sufficient to fix the fracture firmly but which does not endanger any vessels. The lateral end of the wire is then cut off and allowed to lie subcutaneously. The wound is closed by suturing platysma and skin with fine silk.

Postoperatively a sling is worn for 48 hours and then full movement is allowed. Sutures are removed in seven days and in 4 weeks the wire is withdrawn. This may be done by infiltrating some local anaesthetic over the palpable lateral end and grasping it with a haemostat through a tiny nick in the skin. The wire may then be withdrawn without pain or difficulty.

This method has been used in 11 cases with no complications and satisfactory results in all. Patients are hospitalized for 48 hours and at discharge no sling or other form of immobilization is required. All cases have returned to work within 72 hrs. after the accident and have been able to dress, shave, brush their hair and look after themselves without discomfort. Strenuous physical exertion has been discouraged, but in one case the patient was trapped in a burning house one week after operation and was able to descend two stories on a ladder without pain and with no ill effect on the position of the fracture. Several patients have been quite pleased with their personal comfort compared to others they have seen "trussed up like turkeys" with adhesive bandages.

The scars have been inconspicuous and if placed low, no adherence to the bone occurs. There has been one minor infection which quickly cleared up with penicillin and did not delay union. This occurred about the projecting end of the wire before the routine of leaving the end subcutaneously was adopted. Since that time patients have been given penicillin

for 48 hrs. postoperatively and no further infections have been noted.

The following are representative cases.

CASE 1

F.S., female aged 26, admitted to the Royal Victoria Hospital March 2, 1947. She had fallen downstairs 2 hours before admission and sustained a transverse fracture through the middle third of the left clavicle. Immobilization with a figure-of-eight bandage was tried but satisfactory position could not be obtained and on March 5, open reduction and wiring was done under cyclopropane anaesthesia. Postoperative x-rays showed satisfactory position and the patient was discharged 48 hrs. postoperatively. She returned to her work as a typist the day after leaving hospital. One week after operation her home caught fire and she was obliged to descend two stories by ladder. This caused no discomfort and no ill effects. The wire was removed 4 weeks after insertion and patient had excellent union clinically and by x-ray.

CASE 2

H.A., male aged 28, admitted to Royal Victoria Hospital, February 15, 1947. This patient had sustained

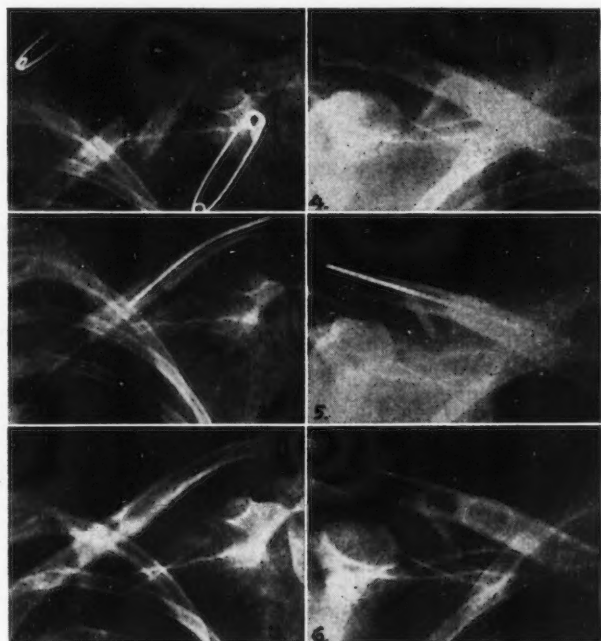


Fig. 1. (Case 1).—Before wiring. Fig. 2. (Case 1).—After wiring. Fig. 3. (Case 1).—End result. Fig. 4. (Case 2).—Before wiring. Fig. 5. (Case 2).—After wiring. Fig. 6. (Case 2).—End result.

an oblique fracture of the middle third of the left clavicle while skiing about 3 hours before admission. Under cyclopropane anaesthesia open reduction and wiring was done on the day of admission. Because of the obliquity of the fracture line an encircling wire was also used. Post-operative course was uneventful. Patient was discharged February 18, 1947 and returned to his studies at the University. The wire was removed 3 weeks later and there was good union clinically and radiologically.

SUMMARY

1. A technique of wiring fractures of the clavicle is described.

2. This method has been used in 11 cases with satisfactory results and no major complications.

3. It is fully realized that open reduction and internal fixation of clavicular fractures should only be used in special cases and under ideal circumstances where meticulous aseptic technique can be maintained.

REFERENCES

1. LEE, H. G.: *New England J. Med.*, 234: 222, 1946.
2. MCKIM, L. H.: Personal communication.
3. MURRAY, D. W. G.: *J. Bone & Joint Surg.*, 22: 616, 1940.

THE BIOLOGY OF METABOLIC DISEASE IN MAN*

I. Arthur Mirsky, M.D.

May Institute for Medical Research, The Jewish Hospital, and Department of Medicine, University of Cincinnati, Cincinnati, Ohio

LOUIS GROSS was interested in a variety of specific subjects ranging from anatomy to therapeutics, from cellular morphology to psychoanalysis. The diversifications of his interest were not the vagaries of a dilettante but rather the heroic struggles of one seeking to encompass the mechanisms responsible for what Mumford so aptly called "The Condition of Man".¹ Even in his earliest studies, Gross sought not merely to describe precisely the vascular supply of various organs, but also to demonstrate that the status of man and his individual organs varies with each age-period as the result of a balance between internal and external forces. His studies of morphologic variation and distortion were utilized merely as a technique to clarify those biologic processes by which the total organism is synthesized and maintained. Implicit in his conclusions was the realization that every response of the individual—morphologic, physiologic or psychologic—represents the effort of the individual to adapt himself to the vicissitudes of his environment in order to continue with the process of growth and survival.

Claude Bernard first clearly recognized the organism's continuous effort to maintain a constant internal environment and described some of the physiologic mechanisms which serve to maintain the constituents of the body fluids at fairly fixed levels.² These studies were further expanded by Cannon's description of the self-regulating processes of individual tissues and

* The Tenth Louis Gross Memorial Lecture, delivered at the Jewish General Hospital, October, 1947.

organs, which he called "homeostasis".³ Richter's subsequent studies on the self-selection of diets by rats revealed that the maintenance of a constant internal environment is achieved also by the behaviour of the organism as a whole.⁴ Pavlov's description of the conditioned reflex;⁵ Freud's discovery of the rôle of unconscious motivation in behaviour as well as his description of the development of the personality;⁶ Alexander's elucidation of the rôle of psychic dysfunction in the genesis of physiologic change;⁷ Selye's demonstration of the development of permanent physiologic and morphologic changes in consequence of the process of adaptation,⁸ are among the many links in the chain of evidence which suggests that even disease is a manifestation of a specific struggle of the individual directed towards survival rather than towards death.

The adaptation of man to changing circumstances is dependent upon both his total capacity for physiologic integration and the pressure of his environmental forces, both organic and social. Essentially, the capacity for physiologic integration is limited by the efficiency and interdependent activity of three mechanisms: (1) The intracellular enzyme systems; (2) the endocrine system and other sources of humoral agents, and (3) the nervous system. A disturbance in the action of any one of these may result in failure to adapt adequately to the environment, a maladaptation which we recognize clinically as metabolic disease. Obviously, the problem of adaptation is also an economic one since it is dependent not only upon the quantitative limitations of the physiologic capacities of man, but also upon the quantitative aspects of the environmental forces to which he is exposed at each particular age period of life.

From the standpoint of the resultant adaptation, one cannot distinguish too sharply between the physiologic capacities of the individual and the environmental factors to which he is exposed. The same environmental factor may be innocuous at one moment and the source of great stress at another, depending upon the organism's physiologic state and previous experiences. Actually, the dynamic interplay between the individual and his environment forms a continuum.

INTRACELLULAR REGULATION

The metabolic activity of the cell represents the innumerable chemical reactions responsible

for energy transformations and is dependent not only upon the integrated activity of specific enzyme systems but also on the materials ingested by the organism and brought to the cell. The enzyme systems are dependent upon the relative amounts and the nature of the food supplied to the organism, so that, as Green put it, "The study of nutrition and the study of enzymes represent two sides of the same coin".⁹ The enzyme systems vary from cell to cell not only in kind but also in quantity; those of similar cells vary from species to species, and within the same species they may vary both quantitatively and qualitatively. Variations in the quantity and activity of specific enzyme systems from individual to individual and from time to time are predetermined by the characteristics of the genes and represent some of the factors that influence the capacity of a specific function.

For illustrative purposes, let us consider the regulation of the blood sugar level and, of necessity, make only a sketchy survey of the responsible mechanisms. It is quite apparent that the blood sugar level represents the dynamic balance between the rate at which sugar enters the circulation and that at which it leaves. Since the liver glycogen is the principal source of the blood sugar,¹⁰ it is obvious that it is the balance between the rates of glycogen formation and glycogen breakdown which determines the rate at which glucose is secreted into the circulation.

The first product formed in the conversion of glucose to glycogen, glucose-6-phosphate, is also the last metabolite formed in the reconversion of glycogen to glucose. The dephosphorylation of glucose-6-phosphate with the reformation of the blood sugar is dependent upon the activity of a specific enzyme, glucose-6-phosphatase, which is present in the liver but not in muscle.¹¹ Obviously it is the balance between the rates of the hexokinase and the glucose-6-phosphatase reactions that determines whether sugar will be removed from or added to the circulation.

The dependence of one enzyme reaction upon those which precede and follow it is apparent. This is indicated further by the fact that a constituent of one system may be essential to the activity of other systems. Thus, ATP which is essential for the hexokinase reaction is also essential to systems that are responsible for the oxidation of fatty acids, the synthesis of acetylcholine and a variety of others.

Substrate competition, increased concentrations of the various foodstuffs brought to the cell and other phenomena occurring within the cell result in changes of velocities of cellular reactions. These changes, in turn, alter the type and quantity of foodstuff utilized by the cell and metabolites produced by the cell. The latter may act outside of the cell and incite the activity of factors remote from the cell in which they were originally produced, as must happen when the mobilization of fat from the depots is accelerated consequent to the diminution of the concentration of the liver glycogen.

HUMORAL REGULATION

The extracellular regulation of intracellular activity is largely controlled by the chemical composition of the extracellular fluids, which in turn is dependent upon the factors that control not only the secretion of humoral agents but also the rates at which foodstuffs are brought into the circulation and carried to the cells as well as the rate at which metabolites are disposed.

It cannot be emphasized too strongly that hormones affect the activity of intracellular enzyme systems only by accelerating or retarding rates of reactions. Under proper conditions, the isolated enzyme systems can function efficiently in the complete absence of hormonal agents. Similarly, various metabolic adjustments can be accomplished in the organism even in the absence of the specific endocrine glands which ordinarily control such adjustments. Essentially, basic adaptations can occur independently of the endocrines but the more rapid changes in the metabolic needs required to meet constantly changing stresses demand the intervention of these hormones.

Although the anabolic and catabolic phases of the metabolic cycle are interdependent phenomena, from the overall point of view, insulin may be considered to exert its predominant action on the anabolic phase since it is essential for the maintenance of glycogen stores, for the synthesis of fatty and amino acids, for the synthesis and storage of intact proteins and for normal growth.

The predominant rôle of the anterior pituitary gland appears to be related to the mobilization of protein and fat from the tissues. Two distinct hormones seem to be involved in this process; the growth hormone which acts directly on the tissues and the adrenocorticotrophic factor which

acts by stimulation of the secretion of the effective corticosteroid hormone of the adrenal.

The so-called growth factor is effective as such only in the presence of insulin. In the absence of the latter, the same factor produces an increase in the secretion of amino acids from the muscles into the circulation, an observation which suggests that this hormone regulates the activity of some intracellular proteolytic enzyme system in such a manner as to accelerate protein hydrolysis in the absence of and protein synthesis in the presence of insulin.

On the other hand, the protein mobilizing properties of the corticosteroids are independent of the action of insulin and for such reason may inhibit growth even in the normal animal. As White has demonstrated, the 11-oxycorticosteroids stimulate the mobilization of protein as a result of the dissolution of lymphoid tissue. Mobilization of protein will result in an increased gluconeogenesis which, in the intact animal, will lead to an increase in the liver glycogen content whereas in the diabetic animal, the same process will induce an increased hyperglycaemia and glycosuria.

Due in part at least to the opposing actions of the growth hormone and of insulin insofar as the intracellular systems are concerned, the administration of excessive amounts of the former will cause the organism to respond with an increased formation of insulin in order to maintain the metabolic balance. With a physiologically inadequate pancreas, as in the dog, or after partial pancreatectomy in other species, the increased call for insulin may exceed the capacity for its production by the pancreas with a resultant relative insulin insufficiency. On the other hand, in the presence of a capacity of the pancreas adequate to respond successfully to this greater stress, administration of the growth hormone will not produce diabetes but will result in a secondary hyperplasia of islet tissue such as occurs in the rat and in most acromegalic patients. Quite similar phenomena can be anticipated after the administration of excessive amounts of corticosteroids, since in both instances the increased rate of gluconeogenesis will elicit the need for a greater insulin response. It is probable also that in addition, the growth and adrenocorticotrophic factors have some specific anti-insulin effect.¹²

The anterior pituitary regulates the total metabolism of the organism by means of its

thyrotropic factor. The exact rôle of the thyroid in the metabolic cycle is somewhat ambiguous. It is essential for the absorption of carbohydrates, the maintenance of the general metabolic level and, at certain stages of development, for growth. Nevertheless, the administration of excessive amounts of thyroid extracts not only fails to stimulate growth but rather accelerates the total catabolism by inducing an increased glycogenolysis and an increased rate of carbohydrates, protein and fat utilization. When the pancreatic reserves have been rendered inadequate by partial pancreatectomy, the administration of thyroid extracts can induce the development of diabetes. However, in the already diabetic animal, it will always cause an exacerbation of the disease.

It appears probable that the most important rôle of all of the hormones is to ensure the responsiveness of the cellular mechanisms to a variety of stimuli. This may be exemplified by the observation that doses of stilbœstrol will produce hyperglycæmia in the intact animal but will not do so in the absence of that amount of adrenal hormone which is necessary for the maintenance of the animal.

The precise site at which the endocrine agents act is unknown. Cori's *in vitro* observation¹³ that extracts of the anterior pituitary and the adrenal can inhibit the hexokinase reaction and that insulin reverses this inhibition has been confirmed by us but we could get no evidence that this is a physiologic phenomenon.¹⁴ At the present time it appears safe to say only that as a result of the action of the hormones on the intracellular systems, a dynamic balance is maintained, for example, between the influence of insulin favouring essentially the anabolic process and that of the hormones of the anterior pituitary and its target glands essentially favouring catabolism. During the lifetime of man, a shift in this balance determines whether growth or senescence will prevail.

Of great significance in any consideration of physiologic integrations are the studies of Selye which culminated in his description of the "Adaptation Syndrome". His studies indicate that the organism responds to a great variety of stresses with physiological changes which are essentially dependent upon the integrity of the adrenal cortex and that excessive activity of the gland is responsible for the diseases of adaptation. It is impossible at this time to discuss this

concept other than to draw attention to a direct outgrowth of these studies.

Recently, Long and his associates¹⁵ have demonstrated that all circumstances which produce an increase in the secretion of the adrenal cortex can do so only through a preliminary activation of the anterior lobe of the pituitary and that one of the most potent factors producing this activation is the epinephrine released by stimulation of the adrenal medulla. It is probable that a similar activation induces the secretion of the other trophic hormones of the anterior pituitary.^{16, 17} Since epinephrine secretion is dependent upon stimulation of the autonomic nervous system, it can serve as the link between humoral and nervous regulation.

NERVOUS REGULATION

Many attempts to evaluate the function of the nervous system in the regulation of carbohydrate metabolism followed upon Claude Bernard's demonstration that puncture of the fourth ventricle produces hyperglycæmia.¹⁸ Zunz and LaBarre's report that the secretion of insulin is stimulated by higher centres acting through the vagi¹⁹ and Cannon's observation that emotional excitation results in glycosuria³ gave further impetus to such studies. Yet, a critical evaluation of the more recent experimental evidence suggests that the central nervous system does not play a significant rôle in the direct regulation of carbohydrate metabolism. It may do so indirectly through its regulation of the secretion of some glands, the regulation of circulation and thereby of the rates at which foodstuffs are brought to the cell and finally through its effect on the organism as an integrated whole.

It is a fact that impulses originating in the hypothalamus activate the sympathetic nervous system and thereby stimulate the secretion of epinephrine with a consequent increase in hepatic glycogenolysis and hyperglycæmia. However, prolonged electrical stimulation of the sympathetics or even a continuous intravenous injection of epinephrine results in a temporary rise only in the blood sugar level. This effect of sympathetic activity is not associated with an increase in fat and protein catabolism but seems to be dependent upon the presence of glycogen and therefore is quite different from the profound derangements observed in diabetes mellitus. It can be concluded only that this end result of hypothalamic activity represents the

effort of the organism as a whole to alter temporarily its cellular metabolic activity in order that it might adapt itself to a rapidly changing environment.

In accord with Long's observations, it would appear that hypothalamic excitation induces a chain reaction consisting of stimulation of the sympathetics, stimulation of epinephrine secretion, stimulation of the secretion of the trophic hormones of the anterior pituitary and finally, stimulation of the secretion of the hormones of the thyroid and adrenal cortex. If this be true, the end result of hypothalamic stimulation represents the direct effects of the adrenocortical and thyroid hormones on cellular metabolism. This hypothesis gains support from Bodo's demonstration that the hyperglycæmic effect of epinephrine is greatly diminished in the hypophysectomized animal.²⁰ Further, the need for such a chain reaction would account also for the fact that the sympathectomized animal fails to respond adaptively to various stressful situations.³ However, since hypothalamic or sympathetic excitation does not produce an increase in fat and protein catabolism, as would be expected from an increase in circulating corticosteroids, doubts exist as to whether this representation of the mechanism of autonomic activity is a valid one or whether it fails to include some yet unknown links.

In regard to the parasympathetic system, the best evidence indicates that vagal stimulation produces insignificant changes in the blood sugar level. In fact, recent knowledge suggests that the hypoglycæmia induced by insulin stimulates the parasympathetic centres rather than the reverse; a fact which is utilized clinically to determine the functional results of vagotomy in the treatment of peptic ulcer.

It is important to appreciate that not only may the nervous system affect the rate of secretion of the endocrine glands but that humoral agents can influence the activity of the central nervous system. Thus, an increase in the concentration of circulating thyroxin will stimulate the activity of the autonomic nervous system, as will also an increase in the oestrogens. Of interest in this connection is the demonstration by Benedek and Rubinstein that the concentration of oestrogens in the circulation exerts a profound psychological influence on the human female in that aggressive tendencies are associated with the high oestrogen phase of the menstrual cycle,

whereas more infantile, dependent tendencies occur during the low oestrogen phase.²¹

Like an increased activity, so also a diminution in the activity of the autonomic nervous system is often associated with profound peripheral effects. Thus sympathectomy increases the sensitivity of the peripheral tissue to epinephrine and other sympathicomimetic agents, whereas ablation of the parasympathetics increases the sensitivity to acetylcholine. The recent studies by Page and Taylor²² reveal that this is true also for humoral agents whose action is independent of the nervous system. They demonstrated that the progressive diminution of the pressor response that occurs in the intact animal on repeated intravenous injection of renin, *i.e.*, tachyphylaxis, is prevented when the sympathetic ganglia are blocked through the use of tetraethyl-ammonium chloride. At the same time the sensitivity to epinephrine and antihypertensive is increased. This indicates that in the presence of an intact sympathetic nervous system, some inhibitory influence is exerted on the responsiveness of intracellular enzyme systems to the action of the extracellular humoral agents.

DIABETES MELLITUS IN MAN

Even an incomplete outline of the various mechanisms involved in the regulation of carbohydrate metabolism indicates quite clearly that until more is known of the components of any system, little can be said of its total capacity and of its liability to fail under stress. Nevertheless, it is obvious that diabetes mellitus in man represents some disturbance in the integrated activity of the intracellular systems responsible for the utilization of carbohydrates irrespective of whether that disturbance originates in the cells themselves or is secondary to abnormalities in the action of the humoral or nervous factors which influence the cells.

It was quite natural that the discovery that pancreatectomy of the dog produces a permanent hyperglycæmia should have led to the assumption that spontaneous diabetes mellitus in man is due to a decreased production of insulin by the pancreas. This classical concept gained further support from the observations that all other forms of experimental permanent diabetes are also dependent upon the destruction of islet tissue.

Unfortunately as it may be for our composure, examination of the evidence suggests that dia-

betes mellitus in man cannot always be attributed to the same cause.²³ Post-mortem data demonstrate that only about 25% of the pancreas of human diabetics reveal sufficient damage of the islet tissue to account for the metabolic disorder. Further, in less than 5% have there been found the typical lesions of pancreatic exhaustion that occur in experimental diabetes in animals. Such pancreatic lesions as have been found in human diabetics are not uncommonly observed in elderly people dying without a history of diabetes, all of which suggests that such lesions may bear no causal relationship to the disease. More important still is the fact that when the entire pancreas in man is destroyed by disease or removed by operation, the pancreatic diabetes that results is relatively mild and neither approaches the severity of spontaneous diabetes mellitus nor requires the amounts of insulin so frequently needed to control the spontaneous disease. Nevertheless, the resemblance of the syndrome of the depancreatized dog or monkey to that of diabetes mellitus in man and the similar response to insulin in both animals and man suggest that in the majority of instances the human syndrome is undoubtedly due to an insulin insufficiency.

However, this insufficiency cannot always be attributed to an inadequacy of the pancreas to supply a normal amount of insulin. Rather, must it be assumed that the amount of insulin normally produced is relatively inadequate for the needs of the diabetic subject. A number of postulates may explain the inability of the "normal" amount of insulin to satisfy the needs of the particular patient. The excessive rate of metabolism of the foodstuffs consequent on an increased ingestion of food or an increased rate of utilization secondary to infection, thyroid disease or other factors may well require abnormally high amounts of insulin for metabolic balance; the insulin produced by the pancreas may be inactivated by circulating humoral antibodies; lastly, although insulin is destroyed in the body under normal conditions, under abnormal conditions the rate of its destruction in the tissues may become excessive so that a normally functioning pancreas can no longer maintain a satisfactory balance between insulin production and insulin destruction. It appears probable that it is an increased utilization or destruction that is responsible for the insulin insufficiency of most diabetics.

That there are factors capable of destroying insulin is indicated by preliminary studies in our laboratory which have revealed that extracts of rat liver, spleen, kidneys and muscle contain a non-proteolytic enzyme system which can inactivate added insulin. This enzyme system is comprised of a dialyzable heat-stable component and a non-dialyzable heat-labile substance, neither of which is effective alone. We also observed that human liver appears to be rich in its content of a similar insulin inactivator. The possible rôle of this system in the genesis of human diabetes must await further study.

Although the anterior pituitary and the adrenal cortex have a profound influence on the regulation of carbohydrate metabolism, there is but little evidence that they play more than a secondary rôle in the etiology of human diabetes. In the dog the permanent diabetes induced by the injections of extracts of the anterior pituitary is always associated with islet destruction, but in acromegalics the pancreas does not show the typical lesions observed in animals. Further, a sufficient number of cases with both diabetes and adrenal insufficiency and diabetes and Simmond's disease have now been reported to suggest that these glands cannot play a major rôle in most instances of human diabetes.

It is probable that in both hyperpituitarism and in hyperadrenocorticalism the concomitant diabetes is due either to an excessive destruction or neutralization of insulin or to an increase in the availability of substrates to an extent that overtaxes the capacity of the intracellular regulatory system, or in rarer instances, the capacity of the pancreas to produce insulin. The exacerbation of an existing diabetes produced by hyperthyroidism can be attributed to the increase in the peripheral utilization of carbohydrates and the consequent acceleration of the rate of gluconeogenesis and glycogenolysis.

The initiation or aggravation of human diabetes by infection can be attributed either to a direct disturbance in the integrated function of the intracellular enzyme systems or to an excessive utilization or destruction of insulin. In accord with this is the fact that the production of an infection increases the insulin requirements of the depancreatized dog.

From 50 to 70% of diabetic subjects present themselves with a history of obesity of variable duration and degree. However, the obesity itself is not the cause of the diabetes since only about

5% of obese patients develop diabetes. The fact that a good many obese non-diabetic subjects develop hypoglycaemia six hours after the ingestion of carbohydrate and that post-mortem examination of the pancreas from such subjects may show signs of increased activity suggests that some extrapancreatic factor has increased the demand for insulin. This may be due to a strain on the capacity to store fat, to an increase in the energy utilized in the constant breakdown and synthesis of the fat molecules in the depots, to a disturbance in humoral integrations consequent to the deposition of fat in glands and tissues, and so forth. In the obese individual with an adequate pancreatic capacity, the increased rate of insulin utilization or destruction is adequately compensated for by the pancreas. Only in those obese individuals in whom the rate of insulin destruction or utilization continues to be excessive and beyond the capacity of the pancreas or of the intracellular and extracellular regulatory mechanisms will a relative insulin insufficiency ensue. In some of such instances, mere reduction of the caloric intake and of body weight will ameliorate the diabetic state. The immediate cause of obesity is overeating, which usually is the result of some disturbance in the emotional development of the individual, so that he reacts to a frustration in the present by withdrawing to a behaviour which was more gratifying in the past. This can be traced to that time when the infant was dependent upon being fed by some other person in order to satisfy his physiologic requirement for food. The satisfaction of this requirement relieved the tension of hunger so that food, or being fed, became associated with a pleasurable sensation as it did also with other pleasurable sensations such as warmth, odours and the soothing aspects of the person who is providing the food. As a result of this experience, eating came to mean something which is inseparable from the relief of tension, affection and other pleasurable feelings; an association which is never completely abandoned but remains to some degree in all individuals.

If an infant has been overindulged with respect to food, or has been given excessive satisfaction in consequence of the parents' attitude toward food and its significance, he may become reluctant to relinquish this early phase of development for a more mature one. Thereafter, he automatically returns to it whenever he en-

counters a situation which is unpleasant, anxiety-producing or frustrating. In such an individual, the tension induced by the need for affection, for prestige or by loneliness may be relieved only by withdrawing to that infantile phase when eating was the satisfactory solution. On the other hand, if an infant's earliest tensions were not relieved adequately, *i.e.*, if he were never entirely satisfied in his requirements for nourishment, he may never outgrow his insatiable need for food or for being given things and will persist in his attempt to receive that satiation of which he was deprived. Thereafter, such individuals may relieve their anger, envy, and the frustration of their desires by eating. Irrespective of the genetic background, it appears that overeating is the obese person's habitual response to the necessity for solving such difficulties as are encountered in adult life by everyone.

Inadequate as it may be, obesity is the resultant of an individual's attempt to adapt to the emotional stresses to which he is exposed. The cause of the overeating and the effect of the obesity are really two distinct phenomena, though it is a fact that the immaturity of the personality is the initial link in the causal chain which, in the individual with a limited physiologic capacity, ends in what we recognize as diabetes mellitus.

Obesity is only one of the many stressful situations which may result in diabetes in the susceptible subject. We have indicated already that infection, liver damage, endocrinopathies and a variety of other organic changes can so stress the organism as to cause failure of inadequate systems. However, with respect to the direct effects of psychic stress, there is still much doubt in spite of the evidence that such stresses can produce profound endocrine and enzymatic changes as may be exemplified by psychogenic amenorrhœa or the activity of serum proteinases under stressful situations.

That an emotional upheaval in the diabetic can result in an exacerbation of the severity of his metabolic disturbance has been observed so frequently that it is taken for granted by most physicians. Thus, irrespective of the severity of the diabetes, an emotional stress will produce a rapid rise in the blood sugar concentration to such levels as to cause an increase in glucose excretion. Some of the emotional factors which can cause such fluctuations of severity were elucidated by Daniels and by Meyer, Ballmeir and Alexander.³¹ The latter demonstrated that

glycosuria increased under the strain of a conflict between the unconscious infantile wishes of the individual to receive and be taken care of and the demands of the adult's environment to give and take care of others. Withdrawal from this conflict into self-pity and passivity was associated with a decrease in the glycosuria.

Cannon's classical demonstration that fear and anxiety can produce glycosuria in the normal cat and normal human gave impetus to the hypothesis that emotional stress may be capable of producing a disturbance in the metabolism of carbohydrate even in the non-diabetic. However, the preponderance of recent evidence indicates that although "emotional glycosuria" can be induced in the non-diabetic human by exposure to an acute emotional episode, a significant rise in the blood sugar concentration does not occur at the same time. Since in such instances, the actual blood sugar change is not sufficient to account for the glycosuria,^{25, 26, 27} it is probable that the latter must be attributed to a decrease in the reabsorption of glucose from the kidney tubules due to a vasoconstriction of the peritubular arterioles such as is known to occur under emotional tension.

Apparently, when the physiologic mechanisms responsible for the maintenance of the blood sugar level are adequate, there is a rapid compensation for any changes induced by the emotional reactions of the individual. However, in the diabetic, where the regulatory mechanisms are already disturbed, spontaneous equilibration is impossible. Hence, it can be anticipated that individuals with some inadequacy of their physiologic regulatory mechanisms may not develop a permanent or even temporary hyperglycemia until the forces of the environment become relatively excessive, as in the advent of some psychologic trauma and/or the revival of some infantile conflict. This is in accord with observations of gastric ulcer patients who present a specific psychologic conflict, which, together with some still-unknown physiologic inadequacy results in the development of a gastric ulcer.

It is probable that the aggravation of the diabetic state which follows upon an emotional excitation is due to an increased hepatic glycogenolysis consequent on the initiation of the chain reaction induced by activation of the autonomic nervous system, the secretion of epinephrine and the trophic hormones of the anterior

pituitary. This may be responsible for the development of chronic invalidism in the diabetic. Also it is conceivable that frequent repetition of such excitation in the non-diabetic may be so stressful as eventually to induce permanent failure of relatively inadequate physiologic mechanisms.

In spite of an adequate diet and insulin dosage, diabetics frequently show marked variations in the severity of their disease, in the absence of infection or other organic change. These fluctuations from hypoglycemia to acidosis are observed in many patients but particularly in the adolescent and so-called juvenile diabetic and heretofore have been attributed by many to variations in the secretory activity of the endocrines. It is more probable that such patients are having difficulties in their attempt to solve the problems of adult life in addition to the conflicts induced by their disease and its treatment. Such marked fluctuations are encountered more frequently in those age periods when the organism is confronted with intense internal conflicts such as at puberty and at the onset of the climacteric, as well as in such situations where the patient is subjected to rigid disciplines with respect to diet and the physiologic care of his disease.

Illustrative of the influence of adaptive stresses on the course of diabetes is the case of a 17-year old boy whose mother died when he was two and who never had the security of a stable home, living either with relatives, his alcoholic father, or in institutions. His diabetes was discovered at the age of 13 while he was living in a school for delinquent boys and where he was most unhappy. In the four years following the onset of diabetes he was hospitalized on 19 occasions because of the severity of the acidosis that he developed in spite of an insulin dosage of 110 units per day. Although the urgency of adhering to a specific diet was emphasized, the patient frequently ate excessively in between the prescribed meals. However, during a nine month interval when he was removed from his unhappy environment and was permitted to eat whatever he wished, he developed no symptoms whatsoever, nor did he have a need to eat between meals. Twenty-four hours after he was returned to his former environment, the patient again developed acidosis and had to be admitted to a hospital.

The psychodynamic studies that have been performed thus far reveal that the diabetic's basic insecurities are related to an infantile desire to be taken care of and like the non-diabetic obese patient, he tries to solve the anxieties induced by his insecurity by eating. In this connection, it is an interesting coincidence that the infant, like the diabetic cannot store adequate amounts of glycogen in his liver.

Recent years have seen an intensification of the controversy relative to diet therapy in diabetics. There are those who believe it is essential to restrict rigidly the diabetic's intake, whereas others advocate that the diabetic may eat whatever he wishes. This controversy is a sterile one since the goal of medical care is the restitution to normality. A restriction of diet, in terms of calories or grams, means more than a mere restriction of food, for with it goes the prohibition of gratifications of infantile pleasures and an intensification of basic insecurities. The physician who is a rigid disciplinarian with respect to the regulation of the diabetic merely assumes the rôle of the punitive parent and aggravates the patient's existing resentment of parental authority. If a free diet means over-indulgence and the production of obesity, it is just as traumatic as is the restricted diet. Essentially, the physician should be concerned with the amount of calories the patient retains rather than the amount he eats or excretes. The proper use of insulin permits for the retention of an adequate quantity of calories. Even with the free diet the physician cannot shirk his responsibility since giving a patient freedom insofar as choice of food is concerned is of little avail unless, at the same time, the patient is handled sympathetically and given an opportunity to mature emotionally so that he may act and eat as a normal individual in a normal environment.

It should be appreciated that the diabetic patient is not so much a disarranged constellation of enzymes and hormones who is spilling sugar, as he is a human being with feelings, hopes and frustrations. The physician whose goal is merely a diminution of glycosuria treats only the urine, whereas the sympathetic physician whose goal is the prevention of chronic invalidism and the establishment of a normal existence, treats the patient.

With the preceding and utilizing diabetes mellitus for illustrative purposes, we have tried to indicate that metabolic disease is the resultant of a relative failure in an individual's attempt to adapt physiologically and psychologically to the stresses of his environment and to emphasize the physicians' approach to an understanding of the etiology, course and treatment of metabolic disease must be made with the realization, so aptly expressed by Alexander, that "Man is at once a biologic organism, an individual per-

sonality, and a member of an organized social group".

REFERENCES

1. MUMFORD, L.: *The Condition of Man*, Harcourt, Bruce & Co., New York, 1944.
2. BERNARD, C.: *Introduction à l'Etude de la Médecine Expérimentale*, Baillière, Paris, 1865.
3. CANNON, W. B.: *Bodily Changes in Pain, Hunger and Rage*, D. Appleton & Co., New York, 1920.
4. RICHTER, C. P.: *Ann. Rev. Physiol.*, 6: 561, 1942.
5. PAVLOV, I. P.: *Conditioned Reflexes*, Oxford University Press, Oxford, 1927.
6. FREUD, S.: *Collected Papers*, Hogarth Press, London, 1924.
7. ALEXANDER, F.: *Psychosom. Med.*, 1: 7, 1939.
8. SELYE, H.: *Endocrinology*, 6: 17, 1946.
9. GREEN, D. E.: *Currents in Biochemical Research*, Interscience Publishers, Inc., New York, Chap. 11, 1946.
10. MANN, F. C.: *Medicine*, 6: 419, 1927.
11. BROH-KAHN, R. H. AND MIRSKY, I. A.: *Arch. Biochem.*, 16: 87, 1948.
12. YOUNG, F. G.: *Brit. M. J.*, 2: 395, 1939.
13. PRICE, W. H., CORI, C. F. AND COLOWICK, S. P.: *J. Biol. Chem.*, 160: 633, 1945.
14. BROH-KAHN, R. H. AND MIRSKY, I. A.: *Science*, 106: 148, 1947.
15. LONG, C. N. H.: *Federation Proc.*, 6: 461, 1947.
16. RAWSON, R. D.: *Recent Progress in Hormone Research*, 1: 119, 1947.
17. SOFFER, L. J., VOLTERRA, M., GABRILORE, L., POLLACK, A. AND JACOBS, M.: *Proc. Am. Soc. Clin. Invest.*, 1947.
18. BERNARD, C.: *Mem. Soc. de Biol.*, 1 (C.R.): 14, 1849.
19. ZUNZ, E. AND LABARRE, J.: *Ann. Physiol.*, 4: 688, 1928.
20. DE BODO, R. C., BLOCK, H. I. AND GROSS, I. H.: *Am. J. Physiol.*, 137: 124, 1942.
21. BENDEK, T. AND RUBINSTEIN, B. B.: *Psychosom. Med. Monographs*, III, 1942.
22. PAGE, I. H. AND TAYLOR, R. D.: *Science*, 105: 622, 1947; *J. Am. M. Ass.*, 135: 348, 1947.
23. MIRSKY, I. A.: *Proc. Am. Diabetes Ass.*, 5: 117, 1945.
24. MEYER, A., BALLMEIER, L. N. AND ALEXANDER, F.: *Psychom. Med.*, 7: 335, 1945.
25. WHITEHORN, J. C.: *Am. J. Psychiat.*, 13: 987, 1934.
26. RICHTER, D.: *Proc. Roy. Soc. Med.*, 38: 674, 1945.
27. MIRSKY, I. A.: *Proc. Central Soc. Clin. Invest.*, 19: 74, 1946.

CASE REPORTS

SCIATIC HERNIA*

Ray Lawson, B.A., M.D., F.R.C.S.[C.]

Montreal, Que.

A sciatic hernia is one that makes its exit through the greater or lesser sacrosciatic foramen. It is a surgical curiosity associated with a diversity of signs, symptoms and methods of treatment. The purpose of this report is to discuss the salient features of the condition and to describe a case recently encountered.

The patient, a male taxi driver, 39 years of age was admitted to the Montreal General Hospital at 3 p.m., January 19, 1948, complaining of crampy abdominal pains, nausea and vomiting.

For the past ten years he had suffered occasional attacks of crampy right lower quadrant pain which radiated down the back of the right thigh and leg. The duration of the attacks were two to five minutes and relief was always obtained by extending the leg and dorsiflexing the big toe. The attacks only occurred when he was lying supine in bed. They were always precisely the same in character and were not associated with definite gastro-intestinal symptoms.

* From the Surgical Service of the Montreal General Hospital, Montreal.

Six days prior to admission he experienced a particularly severe attack of a similar nature but associated with marked nausea. The distress did not subside and the following day he vomited 15 times. Extending the leg and dorsiflexing the toe now aggravated the pain. For the following period prior to admission he remained at home suffering varying amounts of abdominal distress.

On admission the temperature was 98.3, pulse 90, regular, respirations 18. Blood pressure 120/70. He was pale, dehydrated and in a poor state of nutrition. He lay in bed with the knees flexed suffering periodic exacerbations of abdominal pain during which he rolled about with obvious discomfort. Peristalsis was visible through the abdominal musculature. The chest was clear and there was no evidence of cardiac failure. A right upper rectus scar from the closure of a perforated duodenal ulcer in 1934 was present with associated incisional hernia. Efforts to localize the point of maximal abdominal tenderness were unrewarded. Rectal examination elicited marked tenderness in the right lower quadrant but other areas were also tender. The gluteal regions were not examined. There were no urinary signs

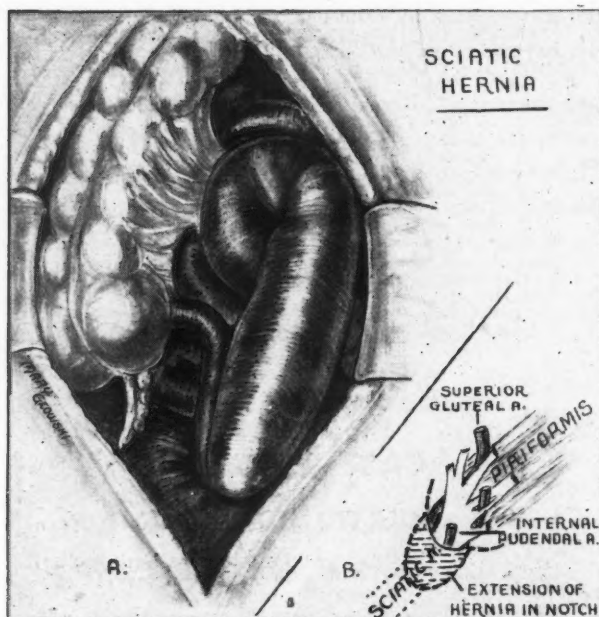


Fig. 1.—(A) Structures entering sciatic notch.
(B) Superimposed by hernia.

or symptoms. A flat plate of the abdomen was made which showed a characteristic picture of small bowel obstruction. Urinalysis; specific gravity 1.028, albumin 5 mgm. %, red blood cells 2 to 4 and white blood cells 4 to 6 per high power field. Granular casts were present. The white blood count was 11,000.

A diagnosis of small bowel obstruction due to adhesive bands was made and the patient prepared for operation by Wangensteen suction, intravenous electrolytes and a blood transfusion. Operation was performed four hours later under endotracheal ether anaesthesia. A low right rectus incision was made. On opening the abdominal cavity tremendously dilated loops of small bowel bathed in straw coloured fluid presented. The dilated gut extended proximally to the ligament of Treitz. At the ileo-caecal junction a short loop of collapsed bowel was picked up and followed down into the pelvis. At this stage the incision was enlarged transversely by transecting the rectus abdominis muscles. The patient was placed in the Trendelenburg position. The collapsed bowel was found to emerge from a recess in the floor of the pelvis together with a loop of dilated bowel (Fig. 1). It was possible to insinuate the little finger into this cul-de-sac but the hard rim of inflammatory tissue which formed the neck was quite unyield-

ing. Pulsating vessels could be palpated on both sides and as visualization was inadequate it was considered too dangerous to attempt to section this neck. On further exploration in the region it was found possible to pass a finger behind some of the rami of the sciatic nerve and to palpate the fundus of the hernial sac and at the same time to express the bowel contents upwards. This movement combined with gentle traction on the incarcerated bowel served to reduce the hernia. It was then possible to visualize the sac and palpate its extent. The neck was about 2 cm. in diameter and the depth about 5 cm. Its position was antero-medial to the sciatic nerve below the piriformis muscle. The bowel wall was viable although grossly discoloured. Unfortunately by this time the patient's condition had deteriorated and his heart was fibrillating. It was decided to terminate the operation without obliterating the sac. The neck of the sac was observed to be surrounded with inflammatory adhesions and it was hoped that they might serve to bridge the defect. The abdomen was closed.

Postoperative treatment consisted of Trendelenburg position, intravenous fluids, Wangensteen suction with a Harris tube, and nasal oxygen. On the second day flatus was passed and the following day there were two loose bowel movements. Convalescence was uneventful. He was discharged on the fifteenth postoperative day. One month later he reported back and stated that he was completely free of his former attacks of pain. He was advised of his condition and told that a recurrence of his trouble might ensue.

Watson¹ in his recent comprehensive textbook has described sciatic hernia rather extensively but up to 1946 was able to find reports of only 35 cases. Zigberman² in a Russian article mentions that Krymov in 1928 reported 25 cases and that Eggers in 1935 reported 35 cases. No doubt many cases escape documentary attention. An appreciable number are associated with minimal or no symptoms and the hernia are discovered accidentally at autopsy. Another group is found at autopsy to be the cause of intestinal obstruction.

The hernial sac usually contains small intestine, but bladder, uterine appendages, large bowel and even a Meckel's diverticulum have been involved. The tumour has been described by Watson as varying in size from a pigeon's egg to a man's head. This author credits the first description of the condition to Verdier in 1753. Three varieties are encountered. The commonest is the suprapiriformis type in which the sac emerges from the great sciatic notch above the piriformis muscle. The subpiriformis type emerges below the piriformis medial to the sciatic nerve and artery and the internal pudendal vessels (Fig. 2). The least common type is the subspinous which makes its exit below the spine of the ischium through the lesser sciatic notch. The sex incidence is about equal. From the standpoint of age, the greatest frequency in males is from thirty to forty, while in females it is most often seen over forty years.

However, a relatively large number of the recorded patients were born with the condition. The etiology in most respects is similar to other varieties of hernia, *viz.*, congenital weak spots in the wall of the abdominal cavity, where vessels and nerves pass out, or where fibrous inter-muscular septa are situated, and are acted upon by excessive, prolonged and oft repeated intra-abdominal pressure. Previous surgery in the region is a recognized cause. One possible factor may be the presence of inflammatory adhesions causing traction and pulsion which eventually force the giving way of the fascia covering the sciatic notch.

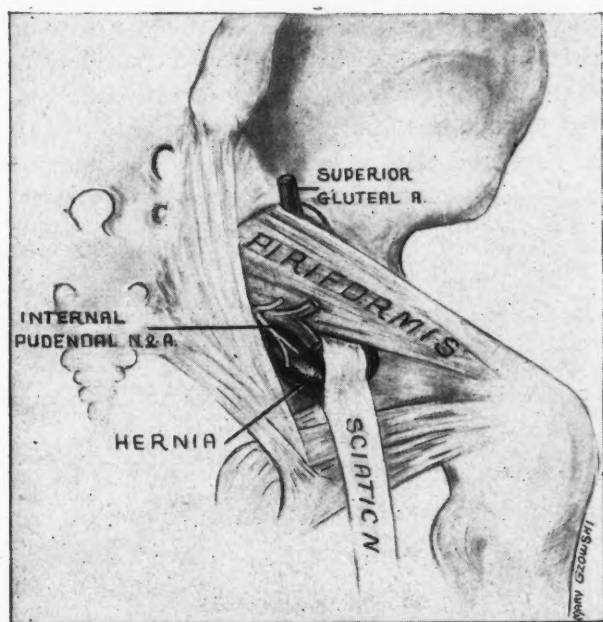


Fig. 2.—Schematic drawing showing posterior view sciatic hernia.

In Watson's series of 35 cases, 13 were treated by operation; 11 recovered and 3 died; 9 had reducible herniae and were treated with a bandage; 8 cases were found at autopsy; death was due in 6 of these to intestinal obstruction.

The symptoms and signs may vary from nil to those of intestinal strangulation. There may be a tumour of varying size over the sciatic notch with or without tenderness. A variety of signs and symptoms relating to the sciatic nerve may result. Intestinal noises may be elicited by auscultation over the mass in some cases. One case was diagnosed by x-ray examination. Abscess, lipoma, myxoma, fibroma, cyst, sarcoma, spina bifida, aneurysm may confuse the diagnosis in the non-obstructed variety.

The treatment recommended by most authors, aside from the relief of intestinal obstruction, is

radical extirpation of the sac through an abdominal approach. The gluteal approach is more difficult. It is not possible to ligate the sac as high and the opening cannot be reinforced as securely. Zigberman's case had a recurrence within three months following such a procedure. Watson recommends stretching or incising the neck of the sac, reducing the contents and then grasping the bottom of the sac with a clamp, inverting and tying it off. Other surgeons prefer to leave the sac *in situ* and fill it with muscle or a piece of detached omentum.

I wish to thank Dr. R. R. Fitzgerald for permission to publish this case and to express my indebtedness to Miss Mary Gzowski for her drawings.

REFERENCES

1. WATSON, L. F.: *Hernia*, C. V. Mosby Co., St. Louis, 1948.
2. ZIGBERMAN, Z. E.: A case of relapsing strangulated ischiatic hernia, *Khirurgia* (Moscow), 5: 79, 1946.

37 Church Hill,
Westmount, Que.

BENIGN DUODENO-COLIC FISTULA

S. V. Railton, M.D., F.R.C.S.[C.]

Welland, Ont.

Most duodeno-colic fistulae reported in the literature are associated with carcinoma of the transverse colon or with ulcerative colitis. We also find that those cases which have been treated surgically have been cured by dissection of the fistula and ligature and excision of the tract. The actual cases of benign duodeno-colic fistula such as the following one are rare indeed.

This 45-year old, Italian woman, was first seen in hospital on February 16, where she had been brought by her physician, Dr. I. Scozzafave, Welland. For several weeks previously she had been having fairly constant pain in the epigastrium going through to the back, not relieved by taking food, was feeling poorly, and vomited occasionally. Screen examination showed that the barium entered the stomach easily and almost immediately cascaded through the lower end apparently directly into the transverse colon. Films taken at this time in the upright position disclosed that she had a large duodenal ulcer with a perforation pocket and a fluid level. This evidently communicated with the transverse colon.

Her history showed that she had had "stomach trouble" for seven years and had been treated by diet and medicine. She weighed only 95 pounds, but the general examination was otherwise fairly satisfactory except for marked tenderness in the upper right epigastrium.

It was decided to try a tube feeding preoperatively to improve her nutrition. On February 17, just 2 days after this was begun she developed sudden terrific abdominal pain and became profoundly shocked. Her blood pressure dropped to 55 systolic and she showed board-like upper abdominal rigidity. We diagnosed a new perforation but her physical condition was so poor

that even with transfusions of whole blood and plasma her blood pressure did not come up to 100 systolic until 36 hours later when her abdomen had again become soft. Previously to this attack her blood pressure had been 130/85 and her pulse 95. Her condition did not improve past this point and so operation was performed on February 19, at which time her pulse was 120 and blood pressure 96/70.

The abdomen was opened through a left rectus incision and no free fluid or evidence of peritonitis was found. There was a mass about the size of a hen's egg attaching the first portion of the duodenum to the transverse colon. We thought it wise to leave the mass entirely alone. Following the method outlined by Devine an exclusion operation was performed, transecting the stomach at the middle third. The lower end was turned in and completely closed in layers; the upper end was anastomosed to an ante-colic 15" loop of jejunum. She was ambulatory after the third day, and was discharged from hospital on the eleventh day with a clean wound, feeling fairly well.

She was seen again on July 4, 1947, and at this time was complaining of weakness and poor appetite. She had been working quite hard in their grocery store and could not eat large meals. Her weight was 100 pounds. At this time she was given iron by mouth and advice regarding diet with emphasis on frequent small feedings. Following this she again began to pick up. At the middle of September her physician stated that she began to complain of pain in the epigastrium. This time the pain was more central and was relieved by the taking of food, especially if she drank a glass of milk. She was persuaded to have another gastric series and at this examination the radiologist, Dr. MacNeill, reported that there was a large marginal ulcer on the medial side of the stoma between the stomach and the jejunum. He noted that the meal left the stomach fairly readily through the stoma and there was no evidence of any obstruction.

The patient was prepared for operation and on November 12 the abdomen was opened again through the left rectus incision. At this examination no lump whatever could be found in the pyloric area. The pyloric stump did not appear to be dilated and there were some adhesions in the area where the mass was previously seen and felt. This was not disturbed. The anastomosis of the stomach and jejunum was examined and appeared to be well healed and to have normal function. The liver was detached from its ligaments on the left side and retracted to the right. The left and right vagi were then isolated and a vagotomy done on each. The abdomen was closed in layers. The patient did very well following operation and was out of bed the next day. She was discharged from hospital on the 10th day following operation.

An x-ray on December 9, showed that there was very little evidence of ulcer visible where the large penetrating stomal ulcer appeared preoperatively. Also there was no evidence of stomal obstruction.

The patient is now free from abdominal pain, is eating moderately well and though still on frequent meals she is gradually increasing the amounts eaten at each time. It would seem as though she at last had a chance of permanent cure.

Several things about this case are interesting. Previous to the first operation she showed moderately high acid values of the stomach and had been in poor health for about seven years although she had never had a perforation or a hæmorrhage. The true condition in her case was not suspected before x-ray as she did not have diarrhoea or other symptoms pointing to a communication between duodenum and colon. At first our intention was

to do a fairly radical partial gastrectomy, but at operation we feared complications and the patient did not appear to be well enough for a vagotomy at that time. We did the exclusion operation as we thought it offered her the best chance of survival in our hands. The appearance of the stomal ulcer came fairly soon after operation but was a natural sequence of poor co-operation with diet and the presence of high acid values in her stomach. As her stoma functioned well vagotomy appeared to be the logical treatment the second time.

CONCLUSION

The above case of benign duodeno-colic fistula was reported because of the rarity of the condition. The case contained complicating factors which made it most interesting and we feel that it has finally been brought to a state of cure and that it is likely to be permanent.

BIBLIOGRAPHY

1. FISHBAUGH, E. C.: *J. Am. M. Ass.*, 68: 624, 1948.
2. ORMANDY, L. AND BARGEN, J. A.: *Proc. Staff Meet. Mayo Clin.*, 14: 550, 1939.
3. REES, C. E.: *J. Am. M. Ass.*, 100: 496, 1933.

METASTASIZING CARCINOID OF THE ILEUM SIMULATING METASTASIS FROM CARCINOMA OF THE RECTOSIGMOID

James W. Wilson, M.D.

Fellow in Surgery, Mayo Foundation,

and

John M. Waugh, M.D.

Division of Surgery, Mayo Clinic,

Rochester, Minn.

Carcinoid has long been a subject of controversy and, consequently, a voluminous literature^{1 to 4} has arisen regarding this interesting but comparatively rare neoplasm. Numerous writers^{5 to 13} have already reviewed this literature. The purpose of this paper is to report a case which illustrates to the surgeon the value of keeping the occurrence of carcinoid in mind so that it may not be mistaken for a manifestation of inoperable spread of another coexisting carcinoma.

A man of 50 came to the clinic, June 14, 1946, complaining of constipation of two years' duration which had required constant use of laxatives. He occasionally had suffered from mild crampy pains in the lower part of the abdomen which had become more severe and frequent in the six weeks preceding admission. These

pains were usually relieved by bowel movements. In the six weeks before admission of the patient the stools had become consistently blood-streaked, but had shown no change in calibre. He had lost twenty pounds (9.1 kg.) in the last year and had noted loss of appetite recently. Nocturia which consisted of urination as often as twice a night occurred. Otherwise his history was negative. Ten days before admission he had been examined proctoscopically by his local physician who removed tissue from a rectal growth for biopsy. The pathologist diagnosed this tissue as adenocarcinoma, grade 2 (on the basis of 1 to 4, in which 1 is the least malignant and 4 the most malignant).

The patient was a poorly nourished man who appeared to be about his stated age. The temperature was 98.6° F. and the pulse rate 72. The blood pressure was 172/98. The only abnormal physical findings were in the abdomen. Here there was slight voluntary splinting, but the liver and spleen were not palpable and no abnormal masses were found. Rectal examination revealed an irregular, hard, fixed mass high in the right wall of the rectum. The prostate was slightly enlarged. On proctoscopic examination an annular, fixed carcinoma, which was found on biopsy to be adenocarcinoma, grade 1, was observed 10 cm. above the anorectal junction. Examination of the blood and urine gave negative results.



Fig. 1.—Left: Annular ulcerated adenocarcinoma of the rectosigmoid. Right: A segment of the terminal part of the ileum with primary carcinoid below (arrow) and with a mass of involved nodes in the root of the mesentery. The primary growth demonstrates typical kinking of the bowel.

Operation was performed by one of us (J.M.W.) on June 21, 1946. On exploration a large, rather fixed growth in the upper part of the rectum and rectosigmoid, with adjacent peritoneal implants, was disclosed. In addition, a small tumour was found in the terminal part of the ileum approximately 12 inches (30 cm.) from the ileocecal valve. This nodule was hard and yellowish and had caused sharp angulation of the bowel as a result of puckering and adhesion of the serosa. The subjacent lymph nodes were enlarged and appeared to be involved by a similar tumour (Fig. 1). Because carcinoid was suspected, a frozen section was made which confirmed the suspicion; accordingly, 12 inches (30 cm.) of small bowel, along with a large segment of mesentery which contained the involved nodes, was excised. Aseptic, end-to-end ileo-ileostomy was then effected with the aid of a three-bladed clamp. The rectal lesion, along with its peritoneal implants, was removed by abdominoperineal resection. The sphincters, however, were preserved. The superior hæmorrhoidal

vessels were severed at their origin, the marginal artery was preserved and the rectum was mobilized from the hollow of the sacrum and seminal vesicles. The redundant bowel was covered with peritoneum. From the posterior approach, the bowel was severed just above the pectinate line without division of the sphincters, and the upper part of the sigmoid was brought down through the intact anus with a Payr clamp.

The portion of ileum removed contained a button-like, yellow nodule, 1.5 x 1.5 x 0.5 cm., which did not extend to the serosa. The cut surface was smooth and yellow. The lesion was sharply defined from the normal tissue. The nodule was primarily situated in the submucosa and muscularis and did not project into the lumen. The mesentery contained three lymph nodes in which similar tumour tissue was found. On microscopic examination sections from the primary growth and lymph nodes were found to reveal evidence of typical carcinoid. They all contained uniform, cuboidal, spherical and cylindrical cells which were arranged predominantly in

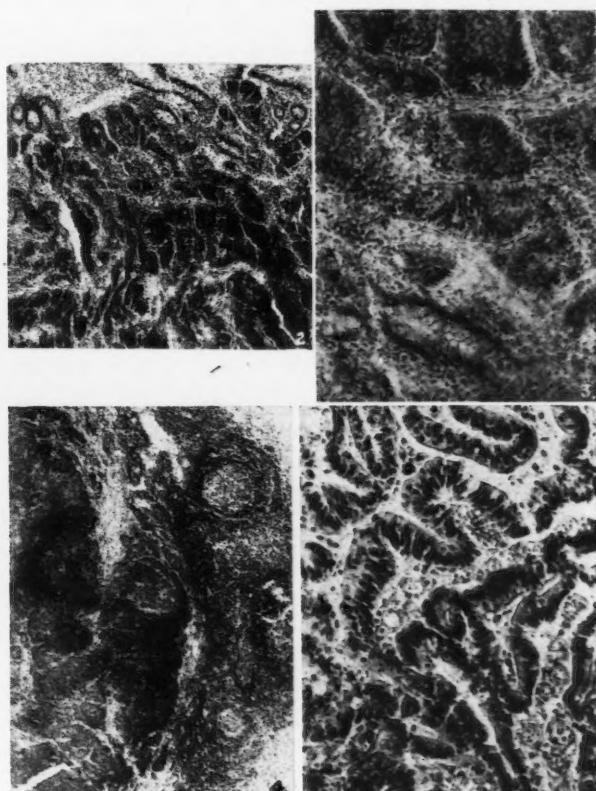


Fig. 2.—Primary carcinoid of the ileum. Bases of several normal crypts are seen at the top with cords of tumour cells extending down into the submucosa (x55). Fig. 3.—Primary carcinoid of the ileum. Bases of crypts at top with tumour cells in solid masses extending through the muscularis mucosæ (x200). Fig. 4.—Metastatic nodule of carcinoid in mesenteric lymph node. Solid masses of cells similar to those in Fig. 2 are visible (x55). Fig. 5.—Primary adenocarcinoma of the rectosigmoid, grade 1. High columnar epithelium, hyperchromatic nuclei, large nucleoli and marked loss of polarity are evident (x200).

solid cords and clumps. In some places palisading of the peripheral cells was observed. The nuclei were vesicular, round and regular, while the cytoplasm was finely granular, with indistinct borders (Figs. 2, 3, and 4).

The specimen of rectosigmoid measured 10 inches (25 cm.) long and an annular, ulcerated adenocarcinoma, 7 x 5 x 1.5 cm., was present 5 inches (13 cm.) from the distal end. Microscopic examination revealed that

six lymph nodes in the adjacent mesentery and the pelvic peritoneum noted at operation contained similar tumour tissue. All those tissues were characterized by irregular glandular structure having acini lined with high columnar epithelial cells which showed hyperchromatism, loss of polarity and numerous mitotic figures. The tumour extended completely through the bowel wall. The pathologist's diagnosis was adenocarcinoma, grade 1, type C (Dukes' method, Fig. 5).

The patient's course was complicated by a moderate degree of ileus which necessitated use of a Miller-Abbott tube from the third to the seventh postoperative day, after which, in so far as the gastro-intestinal tract was concerned, progress was uneventful. On the thirteenth day phlebitis developed deep in the left calf, but subsided, with no sequelae, after nine days of treatment with hot packs and dicumarol. From the time of operation the patient suffered from urinary retention and required catheterization. On the thirty-fourth postoperative day cystoscopic examination revealed hypertrophy of the lateral lobes of the prostate, grade 1 (graded on the basis of 1 to 4 in which 1 represents the least severe and 4 the most severe condition). There was considerable obstruction and diffuse cystitis, grade 2. The patient finally began to urinate satisfactorily on the forty-second postoperative day, after instillation of 1:5,000 solution of gentian violet. A week's treatment of the bladder with 5% argyrol by lavage reduced the residual urine to only 40 c.c. The patient was dismissed on the fifty-third postoperative day. At that time he had good rectal control except when diarrhoea developed from dietary indiscretion.

COMMENT

Even though carcinoids are rare tumours, comprising only 25% of the malignant tumours of the small bowel^{8, 14} and 0.2%^{5, 8, 11} of all gastro-intestinal neoplasms, they are important to the surgeon because they are so amenable to surgical treatment. There is no longer any justification for considering these neoplasms benign¹ as they have been found to metastasize by direct extension, by embolic spread through lymphatic channels to the regional nodes and by invasion of blood vessels with eventual involvement of the liver.

According to a number of reports,^{5 to 9, 11 to 16} evidence of metastasis was found in 20 to 43% of cases of carcinoid of the small bowel. On the other hand, it must not be forgotten that the rate of growth of carcinoid is usually slow and that a number of people have lived for many years in good health after removal of the primary growth, even though metastatic lesions have been left in the liver and other regions of the abdomen. The two extremes of malignancy are illustrated by two cases. The first, reported by Porter and Whelan¹² showed no increase in size of a metastatic lesion when necropsy was performed twenty years after the tumour was first noted and not removed at laparotomy. The second patient, observed by Watz,¹⁶ died of multiple metastatic lesions eight months after

the primary growth and all evident metastatic growths had been excised.

Unquestionably, most carcinoid tumours of the small bowel are present for many years without giving rise to symptoms and the condition is only rarely diagnosed clinically. The symptoms when present, are those of mild, slowly progressive, chronic intestinal obstruction. Miller and Hermann¹⁷ and Dockerty and Ashburn⁸ have pointed out that carcinoids are the only small, nonulcerating, submucosal tumours which cause acute kinking of the small bowel. More careful roentgenologic studies of the small intestine may raise the accuracy of preoperative diagnosis. Nevertheless, the combination of circumstances encountered in this case will probably arise again. The presence of carcinoid was not even suspected before exploration, and any symptoms which may have been due to it were ascribed to the more evident rectal lesion. As the increase in life expectancy permits more people to live into the age in which cancer is most likely to develop, a larger percentage of the few people harbouring silent carcinoids will be explored because of other tumours. This view is substantiated by the fairly frequent reports in the literature of carcinoids found incidentally, at necropsy or on exploration, in patients suffering from other tumours. In Ariel's review,⁵ in 7 of 39 cases of carcinoid of the small bowel the carcinoids accompanied other malignant tumours while 1 of 11 of Ariel's own patients had an adenocarcinoma of the ascending colon. Dockerty and Ashburn mentioned that in 2 of their 30 cases of carcinoid of the ileum the carcinoid co-existed with other carcinomas.

When one remembers that multiple primary growths are found in 20 to 50% and metastatic growths in 20 to 43% of reported cases of carcinoid of the small bowel,^{5 to 8, 11 to 13} it is easy to understand how these tumours may be mistaken for implants in the small bowel and its mesentery. On the other hand, metastatic lesions in the small bowel are unusual in the early stages of most intra-abdominal carcinomas. Thus it is well for the surgeon to keep this tumour in mind before closing the abdomen in an otherwise operable case of carcinoma in which there seems to be an apparently incurable extension to the small bowel. This is especially so if the nodules are only palpated through an incision in the upper part of the abdomen.

SUMMARY

A case of metastasizing so-called carcinoid of the ileum, in which adenocarcinoma of the rectosigmoid, grade 1, occurred simultaneously, has been reported. The possibility that carcinoid of the ileum may be mistaken for evidence of inoperable spread of another coexisting carcinoma, thereby depriving the patient of a chance of cure of both lesions, has been pointed out.

REFERENCES

1. BURCKHARDT, J. L.: *Ztschr. f. Path.*, 3: 593, 1909.
2. LUBARSCH, O.: *Virchows Arch. f. path. Anat.*, 3: 280, 1888.
3. MASSON, P.: *Am. J. Path.*, 4: 181, 1928.
4. OBERNDORFER, S.: *Ztschr. f. Path.*, 1: 426, 1907.
5. ARIEL, I. M.: *Arch. Path.*, 27: 25, 1939.
6. BAILEY, O. T.: *Arch. Path.*, 18: 843, 1934.
7. COOKE, H. H.: *Arch. Surg.*, 22: 568, 1931.
8. DOCKERTY, M. B. AND ASHBURN, F. S.: *Arch. Surg.*, 47: 221, 1943.
9. FORBUS, W. D.: *Bull. Johns Hopkins Hosp.*, 37: 130, 1925.
10. HOPPING, R., DOCKERTY, M. B. AND MASSON, J. C.: *Arch. Surg.*, 45: 613, 1942.
11. HUMPHREYS, E. M.: *Am. J. Cancer*, 22: 765, 1934.
12. PORTER, J. E. AND WHELAN, C. S.: *Am. J. Cancer*, 36: 343, 1939.
13. RAIFORD, T. S.: *Am. J. Cancer*, 18: 803, 1933.
14. CAMERON, A. L.: *Ann. Surg.*, 108: 203, 1938.
15. COLLINS, D. C., COLLINS, F. K. AND ANDREWS, V. L.: *Am. J. Surg.*, 40: 454, 1938.
16. WATZ, C. E.: *Minnesota Med.*, 28: 558, 1945.
17. MILLER, E. R. AND HERMANN, W. W.: *Radiology*, 39: 214, 1942.

HYPNOSIS AS AN EXPEDIENT IN OBSTETRICAL ANALGESIA

Wm. E. Powles, M.D.

Montreal General Hospital,
Montreal, Que.

Mrs. J.W., aged 34, of Quatsino, B.C., came forty miles by sea to St. George's Hospital, Alert Bay, requesting prenatal care on August 21, 1946. Confinement was expected about February 15, 1947. The patient was a stocky, healthy, intelligent Kwakwaka'wakw Indian woman with a fair command of English; previous medical history was negative; her last pregnancy had ended normally seventeen years ago. She was conscious of headache and fatigue after the day's work, never oedema or urinary symptoms, but had palpitation and pounding in the ears occasionally at night. Pelvimetry showed a spacious gynaecoid pelvis.

On this and visits in November and December she had a hypertension of 165/105-100 to 180/100-90 and negative urinalysis despite some nocturia. Returning January 30, 1947, to await confinement she showed albuminuria, blood pressure 170/115-100, no oedema or excessive weight gain; and, failing to improve on rest and strict diet was admitted on February 5 with the diagnoses of (1) elderly primipara, near term; (2) probable essential hypertension; and (3) pre-eclampsia.

Hypertension and albuminuria were controlled quickly on hospital regimen; medical induction attempted twice produced weak pains, soon failing; the membranes were ruptured on February 10. By mid-afternoon hard labour was established. Heroin gr. 1/12 at 7.30 p.m. relieved her distress but caused nausea and vomiting.

At 10 p.m. the cervix was fully dilated and she was prepared and draped for delivery. In expected normal

deliveries our custom was to have the senior nurse give open ether under the physician's supervision: to our consternation the patient firmly revolted at the pungency of the ether and despite reassurance refused also the less unpleasant ethyl chloride. After a few moments of whispered confusion, the nurses were warned to maintain their composure at what they should hear, and an attempt at hypnosis was commenced, despite deep misgivings as to the patient's language limitations and the strained and unusual circumstances. No explanation or warning was offered: the patient was simply told to lie quietly and listen very carefully to directions, to close her eyes, relax, and breathe deeply, then that she would become, and was becoming, very tired and would fall, and was falling, sound asleep; that she was deeply asleep; that she would be very comfortable and feel no pain. These suggestions were repeated cyclically, and naturally, to the point of monotony, without being more specific as to what she would not feel. Vaginal examination, as a test, failed to elicit the flicker of an eyelid; the perineum was "ironed out"; forceps were applied, firm traction and fundal pressure added: the patient's respiration continued deep and quiet and her features peacefully frozen. Even performance of a right medio-lateral episiotomy roused no movement or outcry. A 7 lb. 5 oz. boy was delivered by LOA mechanism and cried lustily. There was no reaction to the routine injections and expression of the placenta, but finally the patient winced and whimpered, though remaining passive, as the perineum was repaired. She was told repeatedly that she would remember no pain or unpleasantness, and would feel very comfortable, then simply to "Wake up now". She opened her eyes, blinked dazedly, and was taken to bed without further ado; the nurse noted that she passed a good night, sleeping on and off. Twelve hours following delivery she was questioned for the first time. She stated, with a puzzled smile, that she could recall nothing of the delivery, and "I didn't even hear the baby crying".

The post-partum course was afebrile and uneventful; lactation being inadequate the baby left the hospital on supplementary formula, having regained birth weight and been circumcised. The mother's blood pressure was 124/90 and urinalysis negative on the ninth day. She regarded the event with equanimity and perhaps unexpressed amazement.

DISCUSSION

A hundred years ago the mesmeric movement was in flood tide, counting ranking medical men among its participants, though it was intimately bound up with occult speculation until the work of James Braid (*fl.* 1843) who first used the terms hypnotism and neurohypnosis and postulated suggestion as their basis.^{1, 4, 10} The use of hypnosis for surgical anaesthesia culminated in James Esdaile's remarkable series of several thousand operations, three hundred of them of the major type, in India during 1845 to 1851. "Orthodox medicine, committed to a denial of the efficacy of psychic healing", welcomed the advent of ether and chloroform,⁴ and hypnosis passed back into the hands of travelling showmen until it again became a serious medical study at the end of the century. Cobb⁶ cites a case of psychosis cured in 1828 following a convulsion caused by camphorated oil, and logically suggests that the immaturity of the psy-

chiatric field was the factor responsible for the failure of the "shock therapies" to appear for over a hundred years. This explanation would seem equally applicable to the decline of hypnosis.

The ideal obstetrical analgesic and anæsthetic is still being sought; that is, an agent having toxic effect on neither mother nor fetus, selectively obtunding pain sensation while promoting a maximum of voluntary co-operation. Reports on the use of hypnosis in labour fulfil these criteria so well that we must ask whether, far from a mere freak, a valuable agent is being neglected by obstetricians and anæsthetists. All medical practitioners use suggestion, many directing it purposefully, and some employing actual hypnosis, in daily medical problems. One of the aims of a previously published series,⁷ of five minor surgical procedures out of six attempts successfully done under hypnosis, was to ascertain whether the method might be drawn upon when other agents failed or were not available. Sampimon and Woodruff¹¹ report 26 of 29 dental and surgical procedures succeeding under hypnosis, the work being born under extreme deprivation of medical supplies in a Japanese prisoner of war camp. These authors noted little racial variation in susceptibility: the well-known verbal barrier may have been overcome, as in our case, by a greater susceptibility in persons of simpler (or more "primitive") cultural background. Certainly it is commonly noted that ill persons and those under nervous stress exhibit heightened suggestibility.

As an anæsthetic, hypnosis has two-fold limitations. First, the experience, time, and trouble required for successful induction: success has required careful preparation, as in Ward's historic amputation in 1842, the patient being "mesmerised" ten times preoperatively. Second, its limited applicability, anæsthesia being attained in from 15 to 90% of various series, as compared with the simple reliability of pharmacologic agents. Thirdly, it may be argued that pain is only suppressed, and not abolished, an objection which, of course, applies also to general anæsthesia according to Crile's hypothesis.

Hypnosis in surgery, obstetrics, and dentistry has been steadily reported on since 1880; a flock of successful cases appeared in the European literature in the early 1920's. More recently, Kroger and De Lee¹² have reported 11 of 12 cases managed successfully throughout labour,

the patients being carefully prepared in late pregnancy. The results, indications, and advantages presented by these authors are most impressive, and they castigate public prejudice as an obstacle to a safe and satisfactory analgesic, from which a fatality has never resulted. Although the above case represents only a successful expedient in a moment of impasse, the whole subject appears to merit further investigation.

REFERENCES

1. ERICKSON, M. H.: *M. Record*, 140: 609, 1934.
2. KROGER, W. S.: *J. Am. M. Ass.*, 120: 714, 1942.
3. HARTMANN, L.: *The Lancet*, 1: 451, 1922.
4. HOLLANDER, B.: *Brit. J. Anæsth.*, 9: 99, 1932; *Proc. Roy. Soc. Med.*, 25: 597, 1932.
5. STEIN, M. R.: *Dental Items of Interest*, 52: 941, 1930.
6. COBB, S.: *Arch. Neurol. & Psychiat.*, 59: 63, 1948.
7. COOPER, S. R. AND POWLES, W. E.: *McGill M. J.*, 14: 415, 1945.
8. WOLFF, G.: *J. Am. M. Ass.*, 87: 981, 1926.
9. FRANKE, U.: *J. Am. M. Ass.*, 85: 1520, 1925.
10. ROSEN, G.: *J. Hist. Med. & Allied Sc.*, 1: 527, 1946.
11. SAMPIMON, R. L. H. AND WOODRUFF, M. F. A.: *Austral. M. J.*, 1945.
12. KROGER, W. S. AND DE LEE, S. T.: *Am. J. Obst. & Gyn.*, 46: 655, 1943.

SPECIAL ARTICLE

MISTAKES AND PITFALLS IN GENERAL SURGERY*

A. T. Bazin, M.D.

Montreal, Que.

When, in January last, I accepted the invitation of the Program Committee to speak to this title I did not appreciate the difficulties of the problem. I am sure the Program Committee did not intend, nor would you enjoy, a list of the mistakes that I as a general surgeon have made. One plan of approach after another has been drafted and discarded and finally I have decided to define and analyze the component parts of the title and to rearrange the order of sequence.

What is a General Surgeon? One answer is that he is the surgeon who does the cutting and stitching which is not done by any one or other of the special surgeons. Fifty odd years ago when I graduated there were in Montreal only 2 recognized branches of special surgery, ophthalmology and gynaecology. Otolaryngology ran these two a close third. But it was only after the lapse of some years that the special branches of urology and orthopaedics were developed. Now we have numerous divisions of surgery in addition to those mentioned; viz., neurosurgery, traumatic surgery, plastic surgery, thoracic

* Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, in General Session, Toronto, June 25, 1948.

surgery, not to mention such subdivisions as proctology and similar artificially limited fields.

But the exponents of these special branches of surgery cannot prosper without a clientele. Therefore it is only in the large centres and especially in teaching centres that we find the development of such specialties. In this day and generation I believe the best exemplars of the all round general surgeon are found in the smaller centres with adequate hospital facilities. In fact I know quite a few who are in rural practice. They meet the emergency no matter what system of the human body is involved. They also honestly recognize their own limitations and refer the knotty problems to the specialist.

A surgeon, of whatever tint, is primarily a physician who is trained to employ mechanical methods of therapy. He must know the fundamentals of medicine. He is therefore a physician and craftsman. If only a technical craftsman he is not a surgeon in the deeper meaning of the word.

In my early days the training of a surgeon was almost invariably through general practice. Emphasis was placed upon a detailed knowledge of anatomy and the young men with surgical aspirations were found as demonstrators in the dissecting room. This postgraduate study of anatomy is now even more an essential, as undergraduate teaching of anatomy has been progressively whittled down.

But although a knowledge of anatomy permits the surgeon to safely find his way around he must also have a definite knowledge of pathological anatomy or pathology in the gross in order to recognize and differentiate the abnormal from the normal. And, as form is in large measure the handmaiden of function, the surgeon must have a basic knowledge of physiology and of physiological and pathological chemistry.

As a craftsman he must thoroughly know, not only the tools *with which* he works but the material *upon which* he works. And finally, he must possess a keen sympathy for, and understanding of, his patients.

He must fully appreciate that he is not treating a disease but a human being afflicted by disease. Oft times the surgeon must inflict pain. Oft times the patient must be made worse in order to be better. Under such conditions the mental comfort of the patient largely depends upon the humanistic attitude of the surgeon. Look back upon the really great surgeons you have known and in all you will find deep wells of human kindness. Did that characteristic detract in any way from their excellence as surgeons? Not at all.

A study of the portrait of Joseph Lister will at once reveal to you what I am so feebly endeavouring to express.

PITFALLS

A pitfall is a trap. Originally, the term implied a special form of trap; one from which there was no escape. We read in books of travel that pitfalls were dug by native peoples to entrap foes, whether man or beast. These natives possessed no weapons adequate for either defence or attack. The pits were dug with the surface opening smaller than the floor diameter and the slope of the sides made it impossible for the victim to climb out. The pit was then camouflaged.

But we also read that *wary* animals detected and avoided the most carefully constructed and hidden pitfall and so escaped destruction. The point is that the wary surgeon will *avoid* the pitfalls of practice.

Any one of you may call to mind a pitfall you have encountered. I will detail an example.

The anatomy and relationships of the extra-hepatic biliary passages are notoriously irregular. What is described as normal occurs in just somewhat over 30% of the total. Irregularities of bile ducts and blood vessels are legion and no one type of irregularity attains to anywhere near 30%. When the anatomy of this region is further complicated by disease or previous operation the irregularities are still more confusing.

Every textbook on anatomy states that in the gastro-hepatic omentum the portal vein lies dorsal to the common bile duct and hepatic artery. Very occasionally it will be found in front.

And if the gastro-hepatic omentum is a mass of scar tissue and the common duct possibly reduced to a fibrous cord the dissection will expose a portal vein in the position and with the appearance of a dilated common duct distended with dark stagnant bile. The unwary surgeon may boldly incise this apparent duct and he is then most certainly in a "pitfall" from which there is no escape.

The *wary* surgeon, no matter how regular the anatomy may appear to be, will aspirate with a fine needle the supposed distended duct and assure himself as to whether the contents are bile or blood. But the needle must be plunged through the entire thickness of the wall and into the lumen; otherwise blood may be aspirated from one of the many tortuous veins in the wall of a common bile duct.

Another example from the same region is the presence of a small accessory right hepatic bile duct which, undetected and divided, may slowly flood the peritoneal cavity with bile, producing a peritonitis which at best means a long disappointing illness, and may cause death.

The wary surgeon will therefore remove the gall bladder from the fundus back to the ducts in order that the presence of such an accessory may be exposed and adequately dealt with.

MISTAKES

Let us soften that word to "errors". And what distinction may we draw between pitfalls and errors? Well, as we have seen, a wary surgeon may avoid a pitfall; but only an omniscient surgeon can avoid all errors. There are errors of omission and errors of commission. In the former class I would place the failure to obtain an accurate and detailed history and to complete a physical and clinical examination. In these days we are too prone to slur over these most important procedures and begin the taking of evidence in the laboratory and x-ray departments.

The practice of medicine may be likened to the procedure in a court of justice. The presiding judge hears the evidence which: (a) may be conclusive, and he renders judgment without hesitation; (b) may be inconclusive, and he demands more evidence; (c) may be confusing and contradictory and he sifts the evidence from all angles before arriving at a decision.

The science of medicine has made wonderful progress but I have always thought that its pathway has been largely along the lines of accumulating more and more accurate evidence. The art of medicine (and of surgical medicine) is the weighing of this evidence and by the exercise of good judgment to arrive at the proper verdict.

For instance: many an abdomen has been opened because of the presence of the symptom triad, vomiting, pain, and abdominal tenderness. But if in the taking of the history it is found that the vomiting has preceded the onset of pain that patient has some malady other than a visceral lesion, possibly the abdominal crisis of impending diabetic coma.

But to avoid errors in diagnosis one must have wisdom born of experience. To quote: "A fool learns only by his own experience; a wise man by the experience of others". That "experience of others" is gained by study, by reading and by attending meetings such as this convention.

Francis Bacon says in his Essays—"Reading maketh a full man—and if he read but little he hath need of much cunning to seem to know what he doth not". But again he says "Some books are to be tasted, others to be swallowed, and some few are to be chewed and digested". And Moynihan, that master of surgery as well as of rhetoric, said "Statistics can be made to prove anything, sometimes even the truth".

Statistics and tabulations have their value, but each individual patient is a separate problem. A surgeon may be a voracious reader but unless he ponders what he reads and with discrimination separates the wheat from the chaff his mind will be in a constant turmoil and his judgment will be faulty.

Errors of commission occur more particularly at the operating table. I believe the most

common fault is lack of respect for living tissues; rough handling, swabbing with dry gauze, tearing and blunt dissection, mass ligation of tissue and the use of heavy ligature material. Surely we appreciate that devitalized tissue has no resistance to infection, and contrariwise, that infection has much difficulty in gaining the ascendancy over vital tissues.

We are too prone to rely upon chemotherapy and the antibiotics to control infection and have perhaps become somewhat careless in respect to the niceties of surgical manipulation. To abstract from Trueta's address in Ottawa last fall—Infection has two components—the "seed" and the "soil".

The lessons of the two Great Wars, especially of World War II have definitely demonstrated that excision or debridement of a wound is of far greater importance than chemotherapy which is of complementary value. Hence, it is a mistake, and bad surgery, to unnecessarily damage and devitalize a single cell by rough handling of tissues.

Even in examination of a patient gentle handling will furnish much more reliable evidence. Whose abdomen will not flinch at a prod from the end of a finger? And thereafter will reflexly protect itself from even a lighter touch.

An abdomen should be surveyed lightly with a warm flat hand, then again with more firm pressure and finally with localizing deep and perhaps finger point pressure. The same principle applies to the examination of any painful part of the body. In children it is wise to start examination on some part of the body quite distant from the focus of complaint and work from the periphery towards that centre.

Another error is to discard well proved procedures for something new. The Levine, Miller-Abbott, and other tubes, with Wangenstein suction, have proved their value and are here to stay. But they have their limitations, also their discomforts. Where decompression of the colon is indicated a cæcostomy or temporary colostomy is far more effective. A properly performed cæcostomy will effectively drain the small intestine, will relieve tension in the colon although it may not empty it, is of less discomfort than a tube through the nose and will always close spontaneously. This is not to deny that both the tube and the cæcostomy are required in some instances.

To carry this illustration further. It is not enough in resection and anastomosis of the colon to sterilize the content of the intestine by protective exhibition of the sulfonamides and antibiotics. There is the mechanical factor to be met, the distension of the colon proximal to the anastomosis, the resumption of active peristalsis, both of them placing strain upon

the suture material but more especially upon the tissues sutured. Hence the advantages of a blow-off vent in the proximal colon (cæcostomy or temporary colostomy).

Another error is to assume that a demonstrated lesion is the one producing the complaints, ignoring the actual lesion which is the real cause of trouble. The most flagrant and frequent instance of this error is in the diagnosis of rectal bleeding. Hæmorrhoids are so common and so easily recognized by patient and surgeon alike that treatment for them is frequently given in a casual manner and too often even without a digital examination.

The possession of hæmorrhoids is no insurance against the presence of some other lesion. Moreover the discomfort produced by some other lesion is frequently the cause of the later development of hæmorrhoids.

Therefore the only safe method is to carry out an examination in progressive steps until a lesion is found which adequately explains the symptoms and signs and the character of the bleeding. A meticulously taken history with all details noted; the character and frequency of the stools; the presence or absence and character of pain or discomfort; the colour and quantity of the blood; the presence or absence of mucus; the odour of the evacuations. Then, in order: examination of the abdomen; inspection of the anal orifice; digital examination; proctoscopic examination, which is an office procedure; sigmoidoscopic examination which requires a tilting table and *finally* a barium enema under the fluoroscopic screen.

At the risk of being considered reactionary I will now state my opinion that a multi-stage operation is good surgery. We may correct anæmia, hypoproteinæmia, the electrolytic balance, vitamin deficiencies, etc., and still have a patient die from too prolonged a session on the operating table.

Granted the disadvantages of prolonged hospitalization, risks of repeated anæsthesia and postoperative complications. But the advantages of a living patient in the end outweigh all these disadvantages.

The proponents of an extensive one-stage operation are usually surgeons not only of vast experience but with an efficient team of similar experience. It behooves the rest of us to be cautious against over-reaching ourselves and our resources in attempting to emulate their example.

The objective of all treatment is to prolong a *useful* life. If a radical procedure entails a high operative risk and with little promise of complete cure; if a palliative procedure entails little or no operative risk but a limited duration of life I firmly believe that it is the duty of the surgeon to be candid with the patient and to allow the patient to be the arbiter of his own destiny.

I ally myself with those surgeons who believe in the avoidance of a permanent colostomy even at slight risk of local recurrence. At the very best a colostomy is a nuisance and the care of it demands living facilities of at least a moderate standard. For the homeless a colostomy is a calamity. He cannot retain employment nor find lodging and finally drifts, if lucky, into an institution for vagrants.

I could easily multiply instances of errors both of omission and commission but have attempted to present the theme under generalizations and categories. If I have given you food for thought I am satisfied and rewarded, and leave with you this sentence which is pregnant with meaning: "A minor procedure often entails a major responsibility".

SUMMARY

A surgeon is both a physician and a craftsman. Pitfalls may be avoided by the wary.

Errors are the result of haste and of misinterpretation of the evidence gathered by history and examination.

And in spite of all our efforts and care to avoid and retrieve errors and pitfalls, failure at times will be our bitter portion because we do not yet understand LIFE itself.

CLINICAL and LABORATORY NOTES

PLASMA PROTEINS IN PREGNANCY

J. L. Macarthur, M.D.

Montreal, Que.

In a previous study (*Am. J. Obst. & Gyn.*, May, 1948) it was observed that the concentration of the plasma proteins became decreased throughout normal pregnancy, until late in the third trimester, and then rapidly rose to normal by the early postpartum period. It is now clearly established that this is due entirely to the normal diluting process of the blood, as shown by changes in the hæmatocrit, which parallels the fall in blood proteins.

It was also observed that a more marked degree of plasma protein decrease occurred in pre-eclampsia and eclampsia. The assumption that this represented a true or absolute hypoproteinæmia, seemed justified by the observation that there was no parallel fall in the hæmatocrit, in these conditions.

The cause of hypoproteinæmia in toxæmia is not established. Any plasma protein depletion may result from acute loss of plasma; excessive excretion of nitrogen; chronic under-nutrition of protein; or failure of formation of albumin and the globulins. Because liver

function seems to be impaired in toxæmias of pregnancy, it is probable that there is a failure of formation to some degree. It is now well established that cystine is essential for proper plasma protein synthesis. Methionine however, appears to be a precursor of cystine in the body, and is vital to health. This assumption is justified by the following observations:

1. Chronic protein depletion in animals will produce necrosis of the liver, generalized œdema, bloody exudates in the abdomen and chest, and commonly, cortical necrosis of the kidneys. The addition of methionine to the diet of these animals will universally prevent, and sometimes reverse these changes.

2. In protein depleted animals, the addition of methionine to the diet will to a marked degree, prevent death from the toxic hepatitis produced by chloroform, carbon tetrachloride or arsenic. Such protection cannot be provided by methionine in the animal which has not been previously starved of protein.

3. Methionine has been shown to greatly increase the clot retraction of blood from patients suffering from essential thrombocytopenia.

treatment without improvement, methionine was given. At this time her platelet count was 68,000. There was an immediate diuresis, loss in weight, and general improvement. No bleeding occurs, and delivery three weeks later was uneventful. It is conceivable that methionine prevented accidental hæmorrhage and stillbirth. The second patient was admitted in convulsions. She presented the classical signs and symptoms of eclampsia, and in addition a platelet count of 52,000, and no clot retraction occurred in twelve hours. She had vaginal bleeding, and repeated severe nosebleeds. The fetal heart tones disappeared after 48 hours. She was given intravenous protein hydrolysate, containing methionine, and spontaneous cessation of bleeding occurred. On the third day, normal clot retraction occurred in two hours. There was no undue bleeding at or following delivery. Stillbirth, with typical clots and immediate expulsion of a separated placenta resulted. It is conceivable that methionine prevented continued bleeding.

The third case was a typical abruptio placentæ, with toxæmia. There were associated retinal hæmorrhages. Intravenous methionine

TABLE I.

TOXIC ABRUPTION	METHIONINE
1. Œdema, hypertension and albuminuria.	1. Anasarca in animals after chronic protein starvation—prevented by methionine.
2. Spontaneous bleeding—placenta, purpura, hæmaturia, retinal, etc.	2. Control of bleeding in both essential and toxic thrombocytopenia in humans—with methionine.
3. Thrombocytopenia often found, clot retraction delayed.	3. Marked increase in clot retraction in thrombocytopenic blood, both <i>in vivo</i> and <i>in vitro</i> —with methionine.
4. Hypoproteinæmia severe.	4. Methionine or cystine proved essential in formation of plasma proteins.
5. Bilateral renal cortical necrosis—common.	5. Renal cortical necrosis produced in dogs by chronic protein depletion. Prevented by methionine.
6. Fatty changes and necrosis of the liver.	6. Protection by methionine against liver necrosis by toxic substances in protein depleted animals.

4. Methionine has produced dramatic reduction and control of bleeding in patients with both essential and toxic thrombocytopenia.

In our toxic group, the most marked decrease in concentration of the plasma proteins, seemed to occur in patients who in addition to œdema, albuminuria and hypertension, had abruptio placentæ. In this condition it is common to note spontaneous bleeding from other parts of the body as well as the uterus, and we have repeatedly found a marked decrease in the number of platelets. A delay in clot retraction occurs, as in essential thrombocytopenia. These findings have been so consistent that on two occasions, accidental hæmorrhage was accurately predicted.

Methionine has been administered with good results in three cases of toxæmia with these associated findings. The first patient was admitted with marked œdema, hypertension and albuminuria. After five days of the usual

was administered, with recovery. No abnormal bleeding followed delivery.

These experimental and clinical findings (Table I) seem to justify the conclusion that:

Pre-eclampsia and eclampsia are due to the action of an unknown toxin. If this agent attacks a woman who has not been previously depleted of protein, the clinical picture of œdema, hypertension, albuminuria, with or without convulsions will result. Because of her protein protection, there is no danger of abruptio placentæ, there will be no thrombocytopenia.

If however, this agent attacks a woman who has been previously depleted of protein, the clinical picture of œdema, hypertension, albuminuria, and perhaps convulsions will result, but in addition there will be great danger of an associated abruptio placentæ, with thrombocytopenia. This condition may be prevented by the administration of methionine.

CONTROL OF CAR SICKNESS IN A DOG BY V-12 (MOSIDAL)

K. A. C. Elliott, Ph.D.,* and
R. L. Noble, M.D., Ph.D., D.Sc.(Lond.)†

Montreal, Que.

Noble, Sellers and Best¹ have reviewed the studies sponsored by the National Research Council of Canada on the treatment of motion sickness. In the course of these studies Noble tested the effectiveness of a large number of barbiturates and found one drug, designated V-12 (ethyl- β methyl-allyl thiobarbituric acid) which showed particular promise. This drug was found to prevent swing sickness in all susceptible dogs tested and no serious side effects were apparent. The belladonna alkaloids, atropine, hyoscine, and hyoscyamine, did not prevent motion sickness in dogs. The effectiveness of V-12 in human subjects varied among individuals.

It seems of interest to report that V-12 has been found during the past three years, to be completely protective against car sickness in a dog. The dog is a male mongrel shepherd, now 6 years old, weighing 25 kg. When untreated he invariably begins to salivate profusely shortly after starting on an automobile trip and vomits within six miles of driving.

When the drug‡ has been administered at least one hour before commencing an automobile trip the dog has never salivated or vomited or shown any obvious symptom of car-sickness. In preparation for long trips, about 250 miles, the dog has received one capsule, 160 mgm., of V-12 by mouth three mornings in succession, the last dose being given on the day of the trip. However, such preparation may have been unnecessary since for many shorter trips the dog has been completely protected throughout the day by a single, 160 mgm. dose an hour or more before starting. The only failure was on an occasion when the capsule was administered about 30 minutes before starting. Since V-12 was first used treatment has been omitted on a number of occasions and salivation and vomiting has occurred each time.

No ill effects of the dose have ever been noted; the dog remained alert, active and friendly. On a number of occasions the drug has been used before driving to the base of a mountain for a day's strenuous climbing. The dog was spirited and energetic throughout the climb and remained protected on the drive home.

The same drug has been used on two occasions for three girls aged 4, 9 and 16 years, all susceptible to car-sickness. They received 50, 80 and 160 mgm. respectively, before breakfast on three successive mornings before long trips. The definite impression was gained that the drug was useful; none of the children vomited. But it did not appear to be completely protective against feelings of discomfort in the case of one child (9 years) and the observations were not well controlled. No signs of ill effect were obvious.

REFERENCE

1. NOBLE, R. L., SELLERS, E. A. AND BEST, C. H.: *Canad. M. A. J.*, 56: 417, 1947.

WORLD REPORT ON VENEREAL DISEASES STRESSES POSTWAR DANGER.—World-wide increases in the venereal diseases reported during wartime continue unabated into the postwar period, according to a report published in the February issue of the *Journal of Social Hygiene* by the American Social Hygiene Association.

The report, unique for its comprehensive coverage and statistical detail, calls new attention to the virtually universal threat to public health arising from VD prevalence and notes that this threat is intensified by present-day speed and scope of population movements between countries.

Prepared by Thorstein Guthe, M.D., formerly of the Norwegian Health Service, now World Health Organization Medical Officer at Geneva, and John C. Hume, M.D., of Johns Hopkins University School of Hygiene and Public Health, with the collaboration of other experts, and approved for publication by the U.S. Army and the U.S. Public Health Service, the report asserts that war intensifies venereal disease problems not only during the period of actual conflict but later as well, adding:

"After the war, venereal diseases still remained a public health problem in all countries, and the impact of military occupation and demobilization has reflected itself in venereal disease rates even higher than those observed during the war."

The report proposes a whole series of recommendations for national and international action to strengthen efforts for VD control. These include proposals for uniform reporting procedures on a world scale; international use of national control measures; establishment of administrative, scientific and procedural standards, within the framework of a uniform plan to be worked out by the World Health Organization, the International Union against the Venereal Diseases, and other governmental and non-governmental agencies concerned.

Reprints of the report, which is being distributed internationally by the World Health Organization, may be obtained in the United States from the American Social Hygiene Association, 1790 Broadway, New York 19. (Pub. No. A-713. *International Aspects of the Venereal Disease Problem*, 40 cents; 50 cents if mailed outside the U.S.A.)

* Montreal Neurological Institute, McGill University.

† Department of Medical Research, University of Western Ontario.

‡ The V-12 was supplied by Abbott Laboratories and now bears the trade name of Mosidal.

THE CANADIAN MEDICAL ASSOCIATION**Editorial Offices—3640 University Street, Montreal***(Information regarding contributions and advertising will be found on the second page following the reading material.)***EDITORIAL****THE GASTRIC ACIDITY IN CARCINOMA OF THE STOMACH**

THE relation between the gastric secretory function of the stomach and the development of gastric carcinoma is not quite clear. It is recognized of course that the function is subnormal in many patients with carcinoma. But whether this reduction precedes or follows the carcinoma is yet to be determined. Recent data* have been compiled in the Mayo Clinic from the records of 277 patients in whom two or more gastric analyses had been made two years or more before the diagnosis of cancer. This lower limit of time made it fairly certain that cancer was not present at the time of the initial gastric analysis. Actually there was an average interval of 11.2 years.

In summary, it was found that the mean secretory activity had been subnormal over this 11.2 year period before the diagnosis of cancer was made. This subnormal function was characteristic of these pre-cancerous patients in any decade of life, but more marked in the later decades. It seems therefore that in this group the process responsible for the low gastric secretory function had been active early in life and in many cases, for long periods before carcinoma developed. And this process had affected the secretory function more in the later than in the earlier decades: it was progressive.

What is the reason for the depression of gastric acidity? It cannot all be attributed to the effects of cancer, as an important part of the depression of the acidity preceded and did not follow the carcinoma. In the opinion of the authors chronic atrophic gastritis is responsible for an important part of the lowered acidity. Theoretically, however, carcinoma might produce gastritis; or it might encroach

upon the acid-producing cells; or it might increase neutralizing fluids by exudation from the surface of the tumour; or produce avitaminoses which would reduce acidity. These effects however are difficult to link up with the very long period which so often existed (as long as 39 years in one instance) between the discovery of the subnormal acidity and the development of carcinoma.

EDITORIAL COMMENTS**Income Tax Deductions for Convention Expenses**

It was, unfortunately, unavoidable that the announcement regarding income tax concessions was rather inconspicuously placed in last month's issue of the *Journal*. Perhaps therefore it may be as well to make further reference to it. In effect, we have now obtained from the Department of National Revenue assurance that deduction of expenses incurred in attendance at medical meetings will be permitted for income tax purposes, effective January 1, 1948. The meetings thus allowed for are three in number; one per year of the Canadian Medical Association; one per year of either a Provincial Medical Association or a Provincial Division of the Canadian Medical Association; one per year of a medical society or association of specialists in Canada or the United States. The expenses must be reasonable and properly substantiated with proof of claim for the number of days present at the Convention and for the expenses incurred, separating transportation, meals and hotel expenses, for which vouchers should be obtained and kept available for inspection. No such expenses will be allowed against income received as salary.

Certificates for the annual meeting in Toronto and for the meeting of the Ontario Division in the same week may be obtained from the General Secretary, 135 St. Clair Avenue West, Toronto 5. The actual number of days in attendance at the meetings should be indicated. Those who attended the Annual Meeting of the Quebec Division last April should communicate with the Secretary, Dr. G. W. Halpenny, Medical Arts Building, Montreal. Those wishing proof of attendance at Specialist Societies held in 1948 should apply to the Secretary of the appropriate organization.

* Gastric Acidity before and after the Development of Carcinoma of the Stomach. Mandred W. Comfort, Mavis P. Kelsey and Joseph Berkson, *Proc. of Mayo Clinic*, 23: 129, 1948.

Immunization Week

The sixth national immunization week for Canada is being observed during the week of September 12, under the sponsorship of the Health League of Canada and in co-operation with Dominion, Provincial and Municipal Health Departments. Efforts are being concentrated on protecting children against diphtheria, smallpox and whooping cough. The almost complete elimination of smallpox by vaccination can be paralleled by the elimination of diphtheria, and the value of whooping cough vaccine is well established. But the elimination of these preventable diseases is still a matter for the future. Diphtheria still shows more than 100 deaths annually, and whooping cough more than 200 annually. Scarlet fever also shows a hopeful diminution in mortality. But eternal vigilance is the price of safety, and this plan of a national immunization week is one of our continual reminders of this important truism.

The Care and Treatment of the Elderly and Infirm

In 1946 a resolution was adopted in the British Medical Association to the effect that present day provision for treatment and care of the elderly and infirm is inadequate. A committee was set up to deal with the question and its report is now available. What focuses attention on this matter is the rapidly growing realization of the change that is coming over the make-up of Britain's population. Forty years ago there were 2½ million people in the country over 60; today there are 6½ million; and it is estimated that by 1971 there will be 9½ million. Unfortunately this development is so gradual comparatively speaking, that it does not evoke a sense of urgency in keeping with its inexorable nature. The Committee was charged with the duty of investigating the existing provision for treatment and care of the elderly and infirm, which is considered to be inadequate. There is apparently no systematic policy for the welfare of the elderly, although there is evidence that the social conscience is awaking to the problem. Even what is being done however is directed towards the care of the fairly healthy elderly people, not the infirm or incapacitated or permanently incurable.

The Committee therefore first classified persons above 60 into elderly: elderly and infirm; elderly sick, acutely or irremediably; psychiatric; and other special groups. The report is carefully detailed, and while it is realized that any building measures for achieving an improved medical service must inevitably be slow, in these days of restricted building, plans cannot be put forward too soon. What can be done now is to awake the community to the degree of melancholy and suffering that attends such a large and increasing section of the population.

MEN and BOOKS

MILESTONES IN CANADIAN MEDICINE*

Heber C. Jamieson, M.B.

Edmonton, Alta.

Three and a half centuries ago the first European colonists arrived at Acadia under Champlain and encountered their first formidable obstacle to settlement—scurvy. Two apothecaries, Daniel Hay and Louis Hebert the first men with any medical skill to practise in Canada accompanied this small group of immigrants. During the first winter many succumbed to scurvy and others were incapacitated so that the projected colony seemed doomed to failure. The preventive method of drinking spruce tea which Jacques Cartier had learned from the Indians over half a century before was unknown to these practitioners and so no relief was found for the stricken people.

Hebert returned to France to qualify as a surgeon and to find what cure might be available for scurvy. In 1608 he arrived at Quebec where a new and larger settlement was planned.

It is interesting to recall that Canada was invaded by home seekers from the four points of the compass. The French came from the East by way of the St. Lawrence and were menaced by scurvy. The United Empire Loyalists left the New England colonies after 1776 to occupy parts of Nova Scotia, New Brunswick, Quebec and Ontario and had already learned how to avoid this disease. The Selkirk settlers arrived by way of Hudson Bay from 1811 to 1815, and soon adopted the eating habits of the company officials and so escaped this affection. There is no mention of scurvy among the early residents of Victoria where Dr. John S. Helmcken became the first doctor about 1850.

Aside from scurvy and the accidents and common ailments incident to a healthy outdoor life in New France the chief concern of the medical men and governors was to prevent the entrance of epidemic disease frequent in the country from which the ever increasing flow of immigrants came, and to curb its spread once it had gained a foothold in the new country. A striking contrast is noticed in the medical histories of the Spanish invaders of the West Indies and Mexico on the one hand and that of the French on the other. Whereas the Spaniards contracted from the natives yellow fever, malaria, and probably syphilis, the new conquerors of Canada imported and disseminated among the Indians smallpox, typhus and cholera. Undoubtedly smallpox

* Read at the Seventy-eighth Annual Meeting of the Canadian Medical Association, Section of Historical Medicine, Winnipeg, June 27, 1947.

was the first and greatest scourge. It wiped out whole tribes of Indians and was so widespread that in time epidemics reached the far western plains with devastating results.

The medicine man and the doctor were alike unable to reduce its virulence and powerless to stem its relentless infiltration among settlers and Indians. Inoculation against smallpox was introduced at Quebec in 1765. In 1802 vaccination was used for the first time in Canada at Liverpool, Nova Scotia. The Indians accepted it and gradually smallpox was brought under control. Another milestone was reached.

With the growth of Quebec a hospital became a necessity so in 1639 the Hôtel Dieu, was erected the second hospital in North America, Cortes having built one in Mexico in 1525. The Hôtel Dieu, Montreal, 1644, was the second such edifice in Canada. The Toronto General was constructed in 1820. It was not until 1872 that the first hospital in the west was built in Winnipeg. The public and doctors did not take kindly to these institutions for a long time. Even in 1889, there were only 0.91 beds per 1,000 of population in Canada. In 1946 this had increased to over 6 beds per 1,000.

Another milestone was passed when in 1750 Bigot introduced regulations for the examination of intending medical practitioners. His reasons are better given in his own words:

"From information we have received, it appears many unknown individuals coming from Europe and elsewhere have engaged in surgery as much in the cities as in the country districts, without any permission; that these strangers whose ability is unknown treat the sick with little care and without giving them relief; distribute worthless remedies which give unsatisfactory results, not having all the experience necessary, and leading as a final result to abuses which are prejudicial to the well-being of the subjects of the King; and to prevent the evil which the obstinacy of many through inexperience may cause we have decided to make the following regulation."

In 1758 a Medical Act was passed by the British Government regulating the practice of medicine and surgery in French Canada. A licence would be granted only after an examination by some person designated by the Governor or Commander-in-chief. Fines were imposed for offenders who failed to take the examination or violated the provisions of the Act. It was not until 1795 that a similar Act was put into force in Upper Canada. Manitoba had its first licensing act in 1871, New Brunswick in 1881, British Columbia in 1886, and the North West Territories in 1888. The Dominion Medical Council did not come into being until 1911.

The medical histories of all the Provinces follow much the same pattern. First came the pioneer medical men with the early settlers. As the population grew epidemic disease required some form of regulation to prevent its

spread. Then hospitals were required. About this stage of development of the country unskilled practitioners and quacks had to be weeded out and so examining and licensing boards were set up. Following this medical societies and journals came into being. When greater growth of population took place medical schools to train suitable practitioners were organized. Lastly, research was established in these institutions. The history of medicine of Canada has followed this pattern. We have seen the first doctors arrive, quarantine introduced, hospitals built and regulations for medical practice set up.

Now one finds the founding of the first medical society. This was the Medical Society of Quebec. The first meeting was held in Quebec City in 1826. The membership seems to have been about equally divided between French and English practitioners. At the first regular meeting twelve papers were presented, six in French and six in English. In this year also the first medical journal in Canada appeared. This was published quarterly in both French and English. With increased facilities to discuss medical problems both verbally and in the medical press a stimulus was given the early physicians to investigate and report on matters of local and general interest and another milestone in Canadian medicine was reached.

The *Montreal Medical Gazette* was established in Montreal in 1845, the first entirely English publication in this country. Many journals followed in Montreal, the Maritimes and in Upper Canada. It was not until 1911 that the *Canadian Medical Association Journal*, formed by the union of the *Montreal Medical Journal* and the *Maritime Medical News*, came into existence.

Just after Confederation in 1867 the Canadian Medical Association was founded. Its early years were precarious. Eight years after its birth it came close to losing its identity and was saved only by the adverse vote of the judicial council of the American Medical Association. At that time it had less than 500 members and these were from the Eastern Provinces. There was no member from west of Lake Huron. Canadian medicine was striving to find its place as an independent unit on the continent when in 1875 a resolution was adopted at the annual meeting at Niagara which threatened its existence.

This resolution called for a union with the American Medical Association. The latter body at its next meeting was of the unanimous opinion "that a union of the two Associations into one is desirable". The judicial council of the American Association by its action in vetoing the matter saved the Canadian Association from absorption. Surely this was a milestone safely passed.

Canada was expanding. The Canadian Pacific Railway soon stretched to the far Pacific. Branches grew off the main line north and south. Rival railways opened up new territory and immigration was encouraged. The medical needs of the people called for more physicians. Montreal was fast outstripping Quebec in population, as a shipping port and in financial importance. Here in 1824 the staff of the Montreal General Hospital created the Montreal Medical Institution, the precursor of the Medical Faculty of McGill. In the same year at St. Thomas, Ontario, Dr. John Rolph commenced a course of lectures on Medicine. In 1830 Dr. Rolph opened a private medical school in Toronto which later became "The Toronto School of Medicine". In 1854 by arrangement with the Board of Victoria College the Toronto School became the Medical Department of that University. In 1850 the Upper Canada School of Medicine, newly formed, offered their services to Trinity College and so two medical schools carried on in Toronto until 1903 when the University of Toronto took over the Medical Faculty of Trinity.

Victoria University built at Cobourg in 1836 was in a curious position as regards medicine. As has been noted it took over the Toronto School of Medicine and granted degrees. From 1867 until 1890 it granted degrees to students of L'Ecole de Médecine et de Chirurgie de Montreal which had been established in 1843, but did not have degree granting privileges.

In 1847 there was in existence the "Incorporated School of Medicine of the City of Quebec". Queen's University established a Medical Faculty in 1854. Dalhousie offered a partial course in medicine in 1867 and was giving a complete medical education by 1872. The London Medical School was founded in 1881, Manitoba Medical School in 1883 and the Medical Faculty of the University of Alberta in 1913. The University of British Columbia and that of Saskatchewan are preparing to give complete medical instruction at the present time.

When the older medical schools were firmly established laboratories became better equipped and money became available for research work. Many valuable contributions were made by all the medical schools, but the greatest was the discovery of insulin and its development by Sir Frederick Banting and his associates, Professor McLeod, C. H. Best and Dr. J. B. Collip, in 1922. Canada too has given leaders in Medicine to other countries. Chief of these was Sir William Osler, first Professor of Medicine at Johns Hopkins and later Regius Professor of Medicine at Oxford. Dr. Arthur Ellis, now Regius Professor of Medicine at Oxford, was the second Canadian to occupy this post.

Many others attained high place in teaching and research work, particularly in the United States. Canadian Medicine was now, unfortunately for itself, exporting its talent.

With the outbreak of the first great war many Canadian physicians joined the Imperial forces or proceeded overseas as medical officers in the Canadian Army Medical Corps either attached to combatant units or with hospitals or Field Ambulances. During the second world war a greater number played their part both overseas and in many research laboratories at home.

With nine medical schools, graduating men equipped to deal with the type of work they are called on to perform, Canada has today taken a high place in world medicine. Looking back over the past, one can point with pride to the milestones which have marked its progress and be proud of the heritage which our forefathers in Canadian medicine have bequeathed to it, and look forward to a future of ever-expanding usefulness in the prevention and care of disease in the rapidly growing population of the Dominion.

210 Tegler Bldg.

MEDICAL ECONOMICS

Medical Services in Great Britain

[The following memorandum, somewhat condensed, has been received from the British Medical Association regarding the recent events in the medical services in Great Britain.—EDITOR.]

THE MEDICAL REVOLUTION IN GREAT BRITAIN

On July 5, 1948, medical practice in Great Britain was transformed from a mainly independent service into an official social service. Doctors and others throughout the world have watched with keen interest the fight of the British medical profession to preserve, in the changing scene, their ideas and traditions of freedom and service. The rapidity of events, however, during the last few months and the profession's acceptance of the new order in May after stout resistance in February have bewildered many onlookers from abroad, and it has been suggested that a concise account of what has happened would be appreciated.

THE DEVELOPMENT OF THE PROFESSION'S POLICY FROM 1911 TO JULY, 1942

The gradual development of the main principles for which the British Medical Association has stood in the recent dispute began with the National Health Insurance Act in 1911. The following principles were then evolved.

1. The patient must be free to choose his own doctor.
2. There must be no intervention by a third party between the doctor and his patient.
3. A general practitioner's remuneration must be related to the extent of his responsibility. The best method of achieving this is by a capitation fee in respect to each patient choosing that doctor.
4. Medical service must be independent of the cash benefits aspect of the insurance scheme.

Between the First and Second World Wars the British Medical Association devoted much attention to the development and integration of the country's medical services. This aimed at extension of the National Health Insurance Act to include dependants; integration of the hospital system; and the co-ordination of all medical and health services to prevent duplication and waste of staff and equipment. In 1942 the British Medical Association initiated a Medical Planning Commission to study the problems which were recognized as inevitable. This Commission outlined a scheme for the development of a national health policy in which the Government and profession could collaborate. Later, however, this Commission was discontinued, since the profession had to divert its attention to Governmental proposals.

THE BEVERIDGE PLAN

The famous report by Sir William Beveridge was presented in 1942. It dealt with social security on a very wide basis and involved certain "assumptions", one of which was a national health service available to all. This introduced a new element embodying the elimination of private practice. Further, the report seemed to contain the suggestion that one of the main functions of the medical service was to preserve the funds of the cash benefit side of the scheme, and that professional certification was to be controlled with this end in view. In spite of the conflict between these implications and the principles laid down by the profession, the British Medical Association was able to hold a series of useful talks with the Minister of Health in the Coalition Government. It was hoped that eventually a satisfactory and efficient service would be evolved. All this, however, came to an end with the change of Government in 1945.

The new Socialist Government came in with a policy for a State medical service with whole time salaried doctors; but whilst the representative body of the British Medical Association had committed itself to acceptance of a public service available to the whole population, it did not agree to a whole time salaried service, which it believed would make the doctor a servant of the State rather than of his

patient and would destroy the freedom of medical practice. However, the Government went on with the social security plans already initiated and introduced a National Health Service Bill which became law in November, 1946, to come into force in 1948.

THE PROFESSION'S SEVEN PRINCIPLES

At this stage the medical profession's Negotiating Committee drew up the following fundamental principles to be used for testing the acceptability of any proposals that might be made.

1. The medical profession is, in the public interest opposed to any form of service leading to the profession becoming full-time salaried servants of the State.
2. The profession should remain free to exercise the art and science of medicine according to its traditions, standards and knowledge, the individual doctor retaining full responsibility for the care of the patient.
3. The citizen should be free to choose or change his or her family doctor, to choose, in consultation with his family doctor, the hospital at which he should be treated, and free to decide whether he avails himself of the public service or obtains the medical service he needs independently.
4. Doctors should, like other workers, be free to choose the form, place and type of work they prefer without governmental or other direction.
5. Every registered medical practitioner should be entitled as a right to participate in the public service.
6. The hospital service should be planned to cover natural hospital areas centred on universities in order that these centres of education and research may influence the whole service.
7. There should be adequate representation of the medical profession on all administrative bodies associated with the new service in order that doctors may make their contribution to the efficiency of the service.

THE FIRST PLEBISCITE

Since the Act conflicted with some of these principles, the question arose whether the doctors should have nothing to do with it until it was satisfactorily amended. A plebiscite was taken amongst the profession, but the result was indecisive. However, it had the effect of leading to further discussions with the Minister. That was in January 1947. In spite of the discussions that ensued, the Minister refused to amend the Act in any degree. The

main objections to the Act and to ministerial statements may be summarized as follows.

1. Restrictions on the free movement of doctors from one practice to another.
2. Abolition of purchase and sale of goodwill practices.
3. Many legal perplexities and anomalies which would lead to prolonged litigation.
4. The introduction of a basic salary in the payment of every general practitioner. It was feared that this would lead to the gradual introduction of a full-time salaried service.
5. No right of appeal from the decisions of the disciplinary tribunal.
6. Appointment by the Minister of the chairman of local administrative bodies.
7. The establishment of a monopoly in hospitals by the Minister.
8. Discretionary power by the Minister to allow practitioners on hospital staff to treat his private patients there or at any other hospital.
9. Representation of the medical profession on administrative bodies was inadequate.
10. In general, too great a concentration of power in the hands of the Minister both in appointing officers and committees and in making regulations.

THE SECOND PLEBISCITE

Negotiations with the Minister on the foregoing points led only to his refusal to consider any amendments. A second plebiscite was therefore arranged for, and in February 1948 members of the profession were asked to state their approval or disapproval of the Act as it stood and whether or not they would accept service under the Act. An overwhelming majority showed disapproval of the Act—38,534 as against 4,479 who approved it. The objectors were found in every branch of practice including Government medical officers and doctors in the Forces.

THE MINISTER RELENTS

About two months later the Minister showed signs of responding to the resistance offered by the profession. He conceded the following points.

1. He agreed that the Minister himself would not be able to institute a full-time salaried service by regulation alone. It would require a special legislation.
2. The proposed universal basic salary would be replaced by a plan in which, whilst general practitioners on first entry into practice would receive a basic salary of £300, established practitioners would

be allowed to choose between this type of remuneration and capitation fees.

3. A committee of legal experts would be appointed to consider the effect of the Act on partnership agreements, and, if necessary, amending legislation would be introduced.
4. Practitioners might enter general practice in the area of their choice, except where the Medical Practices Committee had already decided that no more doctors were needed, or where there was more than one applicant for the same vacancy.
5. Practitioners could decide when they needed additional partners or assistance.
6. No official interference with doctors' freedom of speech or publication.

Since the profession had achieved some of its objects, it was now necessary to determine whether the concessions offered by the Minister were sufficient in extent and character to justify acceptance of service under the Act. This meant a third plebiscite.

THE THIRD PLEBISCITE

The results of the third plebiscite were not as conclusive as those of the second. In a 77% poll, 36% approved of the Act with the intended modifications and 64% disapproved.

Besides this, the Minister in the meanwhile made a few further concessions, including the virtual abandonment of the universal basic salary. After long consideration, the Representative Body of the British Medical Association finally decided to recommend to its members acceptance of service. Whilst recognizing the insufficiency of the safeguards and the misgivings of a substantial section of the profession there was still an earnest desire that a comprehensive health service should be made available to the community. As a result of this advice, large numbers of medical practitioners have joined the new service. The service has come into effect as of July 5, but it is recognized that it will be a long time before the "comprehensive" service promised by the Act can be put into effect. There are also many details to be settled, such as, the amount of remuneration, the terms of service for consultants and specialists, and the details of compensation for the loss of capital value of general practices.

Nevertheless, in spite of some misgivings and apprehension, the profession is entering the service in a good spirit and is determined to do all in its power to make the new scheme a success. Doctors will endeavour to preserve the humanity of medical practice by treating the patient not as a "vehicle of disease" to which rules and regulations must be applied, but as a personality in need of care and advice.

ASSOCIATION NOTES

INAUGURAL ADDRESS*

Wm. Magner, M.D.

Toronto, Ont.

It is with great pride that I stand before you as President of the Canadian Medical Association, but my pride springs only from a recognition of the dignity and the responsibility of this position. It has no tinge of complacency, as I know that I owe my selection to the kindness and the tolerance of my friends, rather than to any merits or achievements of my own. My first duty tonight is to express to the members of general council my sincere and humble thanks for the great honour they have done me.

Since our Victory Meeting in Banff, we have had two years of peace, albeit "a naked poor and mangled peace", a peace without order or stability. The clash of arms has been followed by a clash of ideologies, by a war of nerves, a bitter and portentous war. This is a struggle to confine the slime of communism, which in broad and fetid streams or in malodorous trickles seeps through the countries of the world, sickening the souls of men.

Communism is more than an economic plan. It is more than a great political power. It is a materialistic and ruthless philosophy. It is a heathen cult which "fills a vacuum left by the decay of faith". It thrives only under conditions of misery and insecurity, and it must be combated on a global scale by measures directed towards the spiritual and material redemption of the distressed peoples of the earth. The answer to communism, says Ebon, "is security with liberty rather than at the price of liberty, bread with freedom rather than at the price of freedom". This is the answer, and reluctantly we must now agree that economic aid to the war-shattered nations, unbacked by military power to protect their independence, will not arrest communist infiltration. Our hope, our confident hope, that the old world will be rescued from the despotic rule of a victorious totalitarian state, that we ourselves will escape ultimate abasement and slavery, lies chiefly in the power, the vision and the political acumen of our freedom-loving neighbour, the United States of America. Now, among the nations of a war-torn world, it alone has the material resources to fight the cold war successfully. It alone has the military might to call halt to Soviet aggression.

It is only when freed from the baneful influence of communism, that we may look for a return of "gentle peace . . . (to) . . . bless us with her former qualities". But true and lasting

peace demands more than neutralization of this evil. It will not be ensured by treaties, which before now have become scraps of paper. It requires a change in the hearts of men, an awakening of the human conscience, and adherence to the teachings of Christ. We must seek a final solution of world problems, terrifying in their complexity, through individuals and not through governments. We must destroy national fanaticism. We must replace racial and class hatreds by "collaboration, concord and peaceful work".

Banded into a great fraternity which knows no barriers of race or creed, dedicated to the relief of human suffering, and to the betterment of the physical and mental health of the people, respected and influential in their communities, doctors, as individuals and through medical associations can play a great part in the building of a new world. This opportunity, this responsibility, has been recognized. Assembled in Paris, last September, delegates from forty-eight nations formed the World Medical Association: a voluntary alliance pledged to the promotion of the health of all the peoples, and to the promotion of world peace. Any doubts as to the potential influence of this guild in the furtherance of international understanding, the palliation of human misery, and the consequent frustration of communism, should be dispelled by the absence of the arch-disturber, Russia, from the Paris conference, and by the attempt to wreck the conference which was made by unavowed minions of the Kremlin. We are indeed proud that one of our own, one who is peculiarly our own, T. C. Routley, has played a leading part in the moulding and launching of the World Medical Association, and that he is now chairman of its executive council. Tonight, in recognition of Dr. Routley's service to humanity in this connection, you have presented him with the Starr medal.

Side by side with the voluntary body, the World Medical Association, we now have the World Health Organization, formed and supported by the governments of the United Nations. We cannot "look into the seeds of time and say which grains will grow and which will not", but I believe that the Canadian Medical Association and the Government of Canada have acted most wisely in lending full support to these great humanitarian ventures.

With the full knowledge that it will be many years, and perhaps even many centuries, before the earth becomes in truth one world, ruled by justice and charity; realizing that we must remain vigilant and armed against outside aggression, while facing the stern challenges presented by grave defects in our own body social; we must struggle against discouragement, against a sense of our own futility. We must hold fast to faith in man's high destiny. We must believe, with du Noüy, that today he stands "between the past

* Read at the Seventy-ninth Annual Meeting of the Association, Toronto, June 23, 1948.

heavily weighed down with memories of the beast, and the future rich in higher promise". We are told that it is a million years since primitive man appeared upon the earth. A lifetime, a century, is as a moment in the development of the great pageantry of the human race. In the troubled years ahead, we must each play his part, with confidence that in God's time good will prevail over evil, and peace and beauty will return to the world. "The day is short and the work is great. The reward also is great and the Master praises. It is not incumbent upon thee to complete the work but thou must not therefore cease from it."

Proceedings of General Council for the 79th Annual Meeting, Toronto, June 21 to 25, 1948

The following summary deals with the proceedings of Council at the Annual Meeting of the Association in 1948. Full details of reports are being prepared in reprint form and may be had on application by any member of the Association.

In general it may be said that in all respects the meeting was completely successful. The attendance at Council was 125, out of a possible 143, the largest number yet recorded, and the total attendance at the meeting reached the record proportions of 2,024 doctors and 309 ladies. The program was unusually full and of a very high technical order. Scientific exhibits were again on display after a long interval during which they had not appeared. The commercial exhibits were also well selected and of great interest.

The Chairman of Council, Dr. Harris McPhedran, reviewed the work of the Association for the past year.

The Annual Meeting for 1949 is to be held in Saskatoon, in the week of June 13, with the following proposed future dates:

1949 — Saskatoon	1954 — Vancouver
1950 — Halifax	1955 — Montreal
1951 — Montreal	1956 — Winnipeg
1952 — Alberta	1957 — Toronto
1953 — Ottawa	

These suggestions are recommended only after the most careful consideration and will in all cases be subject to the approval of the Divisions.

Membership of the Association has shown an increase of paid members of 1,826 (as of May 6) to reach a total of 8,502. It is gratifying that more than 73% of the returned medical officers have paid their fees this year, after completion of the complimentary membership extended to them. Attention was drawn to the fact that whilst undergraduate students were ineligible for ordinary membership their potentialities for future members were so im-

portant that CAMSI had been authorized to enroll as subscribers to the *Journal* at a reduced rate as many students as possible. There are about 908 such student subscribers at the moment. It has also been arranged to accept medical officers with permanent commissions in the Services as members-at-large. Continual efforts are being made to add to our membership those who at present do not belong to our organization.

It was shown by the Managing Editor that the circulation of the *Journal* was roughly 3,000 more than the number of paid-up members. This is due to subscription from libraries, hospitals, doctors residing outside of Canada and students.

TREASURER'S REPORT

The Honorary Treasurer's report showed the following.

REVENUES AND EXPENDITURES

"Our revenue for the year 1947 reached the record figure of \$153,790.80, almost \$14,000.00 above that of the preceding year. This increase comes from higher revenues from membership fees, subscriptions and advertising. The expenditure, however, increased by some \$23,500.00. Approximately \$17,000.00 of this is the increased cost of printing the *Journal*; the rest is increased operating costs. The net result of these increases is that a surplus of some \$8,000.00 in 1946 has been replaced by a deficit of \$1,411.22 for the year 1947."

BUDGET COMMITTEE

The Executive Committee, at its October meeting, passed a resolution that all expenditures, which did not fall within the Annual Budget, must be studied and approved by a Budget Committee before they could be carried into effect. In this way it is hoped that there may be closer control of the expenditure of the funds of the Association.

INVESTMENTS

Our investments continue to be supervised by The Royal Trust Co., our financial advisers.

MEDICAL ECONOMICS

The Committee on Economics presented the following report.

Six meetings of the nucleus of the Committee on Economics have been held in Toronto and a full report of all business has been transmitted to each of the Divisional members of the Committee.

Your committee this year has confined its deliberations largely to the study of compulsory health insurance. We did so feeling that the experience of the medical profession in some countries warranted us in being as fully prepared as possible to adopt a positive attitude toward governments in any proposals they might make to extend compulsory health services. We feel that clarifying our own attitude as fully as possible to government sponsored health insurance has many advantages over watchful waiting.

We recognize that all political parties in Canada have approved of health insurance as a means of providing medical services, that several provinces have already enacted legislation and that the Government of Canada has made very specific proposals to the provinces relative to health insurance. Moreover, it is noted that increased

expenditures are provided this year in the Departmental budget under the heading, "Health Insurance Studies".

The relationship of the Canadian Medical Association to previous Federal considerations of Health Insurance has been defined and is well known. General Council in May 1944 adopted as its own 18 Principles relating to Health Insurance, the first one of which states: "The Canadian Medical Association approves the adoption of the principle of contributory Health Insurance, and favours a plan which will secure the development and provision of the highest standards of health services, preventive and curative, provided the plan be fair both to the insured and to those rendering the service."

Your committee decided to proceed to a study of all available plans and enactments respecting government sponsored health insurance, using the Principles as the yardstick by which to measure them. In this manner an analysis was made of A Draft for a Health Insurance Act, Canada, popularly known as the Heagerty Bill. A similar study was made of the Murray-Wagner-Dingell Bill of the United States and of the Swift Current experiment in Saskatchewan.

The restlessness of the Canadian people in their searchings for better health requires that we as doctors do not sit around and wait for something better to happen. We concur in the report of our Assistant Secretary, Dr. A. D. Kelly, when he writes of the Swift Current experiment: "An observer gathers the impression that here is a successful experiment in the large-scale provision of medical care, courageously applied, efficiently managed and remarkably free from attempts to make the facts fit preconceived ideas, financial and otherwise".

The provision of complete medical care is so complex that we should encourage other experiments where local conditions are different. These should be thoroughly studied and their lessons assimilated before being copied.

As no official link existed between the Association and the Department of National Health and Welfare, it was suggested to our Executive Committee that they offer to appoint a small committee to advise the Department of National Health and Welfare on matters relative to Health Insurance and that the advice of this committee be available on a provincial level on request of the divisions. This was done. The committee consists of the Chairman of the Committee on Economics, the Consultant in Medical Economics, the General Secretary, and the Assistant Secretary.

The Department of National Health and Welfare accepted the offer regarding the establishment of such a committee. In February, Dr. T. C. Routley, in conference with the Hon. Paul Martin, Minister of National Health and Welfare, and his Deputy Minister, Dr. G. D. W. Cameron, was informed that considerable attention was being given to problems relating to social security, and more particularly to health insurance. The Minister felt that the time had arrived when a useful purpose would be served if officers and members of his department sat down with a representative group from the Canadian Medical Association to have a look at certain proposals.

To this end your advisory committee in March discussed these proposals with the Minister and his advisers. This discussion was informal and exploratory. It was a march past of what they were thinking and was not a discussion of any bill or bills. However, the Minister was emphatic in stating that the pressure politically for health insurance was very great; that monies spent only for studies and planning would be considered quite inadequate. He felt that there was a growing restlessness in the country that something be done to meet the demands for better health for Canadians. He felt that health insurance should be implemented in stages and that the first stage could be realized by grants in aid.

It will be recalled that in 1945 the Federal Government suggested to the provinces that they should undertake a survey of their health needs and the offer of a grant for Planning and Organization was made. At that time it was intended that the outcome of this

period of planning and organization should be an acceptable plan for the introduction of Health Insurance in progressive stages. Present Departmental thinking envisages a study of the whole field of health by the provinces according to a master plan, but does not undertake to limit the recommendations which may emerge. Your committee is heartily in favour of such study being undertaken and, if the funds become available, it is urged that each Division participate to the fullest extent in order that the provincial plans may reflect the composite opinion of the doctors.

Additional Health Grants are under consideration for general public health, venereal disease, and possibly for cancer and hospital construction. Viewing the health of Canadians from the Atlantic to the Pacific we find in 1946 that the infant mortality rate in one province was 35 and in another it was 66 per 1,000 live births. We find that neo-natal mortality varied from 16 per 1,000 live births in one province to a rate of 35 in another province. The percentage of live births occurring in hospitals and other institutions to the total occurring in the province varied from 35.6 to 95%, depending on the province. With such varied medical facilities, we must consider that health grants have much merit as a means for improving health services. They seem to be a reasonable method of attempting to build from the basement upward rather than from the roof downward.

It must be emphasized that in our discussions with the Department of National Health and Welfare it was repeatedly pointed out that the plans under consideration do not necessarily represent Governmental policy. They may be accepted and implemented, they may be materially modified, or they may be abandoned. It is a matter of satisfaction that we are consulted at this stage of Departmental planning, since it is before policies have become fixed that discussions are mutually advantageous. It is our hope that the medical profession will continue to merit the confidence of government and in order so to participate we must be constructive in our recommendations.

We are informed that the Department of National Health and Welfare considers that Health grants such as these may be thought of as instalments of Health Insurance, and will be designed to fit eventually into a scheme of health insurance by providing a minimum standard of essential health services in Canada. Also, they aim at making it possible to give free treatment for all persons within the province suffering from tuberculosis, mental disease, and venereal disease. This brings into focus some feature perhaps we should look at.

Millions of dollars added to various departments of health will make these departments very strong and influential. Where does the private practitioner, be he specialist, consultant, surgeon or general practitioner, fit into the picture? For the moment may we consider only one of these groups, namely the general practitioner. If treatment is to be free in clinics, it is going to be very difficult for general practitioners to do their legitimate share of this work unless his services also are free to the patient. In other words payment for the general practitioner must be assured just as is the payment of the workers in the department and clinics in the same field and from the same fund. We commend for your consideration the principle that monies made available to Health Department be available to all workers in these fields whether they be private practitioners or departmental employees, and that these services be so planned.

A way of life that develops institutions tending to progress along impersonal lines and setting their own arbitrary standards is in danger of neglecting individual development and personal excellence. We suggest that more doctors interest themselves in and inform themselves on compulsory Health Insurance. A greater emphasis should be laid on Medical Economics as a suitable subject for addresses and discussions at medical meetings at all levels. If and when various health insurance instalments confront us we will be in urgent

need of having a large body of medical men who can think as doctors and as citizens with equal facility. Along this way lies our best hope of achieving what is best for ourselves and for the Canadian people.

Attention was drawn also to the announcement made by the Government of Canada regarding grants to the Provinces for the extension of health services. These would be on the following basis.

1. Health Survey Grant (formerly called Grant for planning and Organization)—\$5,000 basic grant to each province, plus 5 cents per capita of 1941 population; total to any province to be not less than \$15,000. The Prime Minister made it clear that this grant is not conditional on the Provinces undertaking to enter a health insurance plan. Total amount of this non-recurring grant is \$625,000.

2. General Public Health Grant—35 cents per capita, increasing in succeeding years to a maximum of 50 cents per capita. Provinces must undertake at least to maintain their expenditures in this field at the present level. Initial total grant \$4,404,000 per year.

3. Tuberculosis Control Grant—\$25,000 basic grant to each province, the remainder to be calculated 50% on the basis of population and 50% according to the average number of deaths from tuberculosis over the previous five years. Initial annual grant \$3,000,000 rising over a period of years to \$4,000,000.

4. Mental Health Grant—\$25,000 basic grant to each province, the remainder distributed according to population. Initial annual grant \$4,000,000 rising over a period of years to a maximum of \$7,000,000.

5. Venereal Disease Control Grant—\$500,000 annually. Current grants of \$225,000 are being made to the provinces for this purpose. The new proposal increases this grant by \$275,000.

6. Crippled Children's Grant.—To assist the Provinces in developing a program for the prevention, control and treatment of crippling conditions in children, a grant of \$500,000 annual is made, to be divided on the basis of population.

7. Professional Training Grant.—In order to meet the need for larger numbers of professional personnel in the public health and related health fields, the Dominion will make available to the Provinces \$500,000 annually. This amount is twice that originally proposed in 1945.

8. Public Health Research Grant—\$100,000 initial annual grant to be increased by \$100,000 annually to a maximum of \$500,000.

9. Cancer Control Grant—\$3,500,000 maximum to the Provinces. The Dominion will contribute on an equal share basis the cost of any approved program for the control or treatment of cancer which the Provinces may undertake, otherwise on a per capita basis. This is a new grant not mentioned in the 1945 proposals and the details of its distribution have not been made entirely clear.

10. Hospital Construction Grant.—In the 1945 proposals, low interest loans to the Provinces were mentioned as an aid to the construction of hospitals. The Government of Canada now offers grants to the Provinces on the following basis: \$1,000 per active treatment bed; and \$1,500 per chronic or convalescent bed. One condition which it is proposed to attach to the hospital construction grants is that the Province shall match the Dominion contribution or better it, and that the Dominion contribution shall not in any case exceed one-third of the total cost per bed in any project. It is estimated that the Dominion contribution under this heading will amount to \$13,000,000 annually for the next five years.

It is estimated that the total Federal expenditure in respect of the above grants will be \$30,000,000 per year for the next five years.

It may be said in passing that this report was adopted unanimously. The whole subject of medical economics is under continual study by the Committee, as may be seen by this very thorough report.

PREPAID MEDICAL CARE PLANS

This subject, which is very intimately bound up with medical economics, is that of prepaid medical care plans. A committee to study this matter has been working for the last year and consists of six members of the Canadian Medical Association resident in British Columbia, and a professional member from each of the seven existing medically sponsored voluntary prepaid medical care plans in Canada. The Committee met three times during the year, and on February 6 and 7 held a two-day conference at which Mr. F. E. Smith, of Associated Medical Care Plans, and Dr. G. D. Leitch, of Portland, Oregon, were present.

A very full discussion took place on the report of this committee, and it was felt necessary at one stage to obtain the advice of our solicitor. It was finally agreed that the following recommendations should be approved.

"1. Whereas this Executive Committee has indicated its approval of the formation of a Federal Corporation to co-ordinate activities of medically-controlled plans of voluntary prepaid medical care operating with the approval of the organized medical profession in the Canadian provinces; and whereas the launching of this corporation is a matter of interest to the whole medical profession; Therefore be it resolved that Doctor A, Doctor B and Doctor C be authorized to communicate with the Divisions to determine those plans operating in their area with the approval of the Division, and to invite one representative from each of these designated plans to assemble for the purpose of applying for the above mentioned Federal charter.

2. Your sub-committee would further recommend that the persons designated by the Canadian Medical Association to convene the conference of the Plans be Dr. L. H. Leeson, Dr. C. C. White and Dr. A. E. Archer."

Following the approval of the above recommendations by General Council, some further discussion took place on the advisability of the Canadian Medical Association being represented on the new corporation by members nominated by this Association. This matter was clarified by the following resolution of General Council, moved by Dr. White, seconded by Dr. Magner:

"That this Council approve the principle that the C.M.A. shall be represented on the new corporation to correlate medically controlled plans of prepaid medical care; and that the constitution of the new corporation be so written as to permit the nomination of members of the corporation by the C.M.A."

INCOME TAX

In a Supplementary Report to the section on income tax in the Report of the Executive Committee, Dr. Routley reported for the Special Negotiating Committee the results of an interview held on June 14 with the Honourable

Douglas Abbott, and with Mr. Scully, Deputy Minister for Taxation, Department of National Revenue. He stated that two main proposals were put forward: (a) A request that doctors be permitted to deduct the expenses of attending certain medical meetings; and (b) that salaried physicians be permitted to deduct certain professional expenses.

In respect of the first proposal the following letter had been received from Mr. T. W. Bullock, Director General Individual Assessments Branch, Department of National Revenue:

"With reference to the discussion had with you and your colleagues on the 14th instant, this will advise

you that the Department will give favourable consideration to some of your requests, commencing with the year 1948. A Directive setting forth the conditions under which reasonable expenses incurred by doctors in attending certain conventions of the Medical Associations will be allowed for income tax purposes, is being prepared and will be issued in due course.

This preliminary indication is being given to you in view of your request to be advised by June 21 of the attitude of the Department towards your submission."

In respect of our requests on behalf of salaried physicians, it was made perfectly clear that the new Income Tax Act established beyond question that the salaries of all taxpayers were to be regarded as net income and not subject to deductions for expenses of any kind. It was

Canadian Physicians' Fine Art and Camera Salon



"Les Grandes Eaux". By Dr. Dominique Gaudry, Chicoutimi, Que. One of the prize winning photographs exhibited at the Fourth Annual Fine Art and Camera Salon, Toronto, 1948. Sponsored by Messrs. Frank Horner Ltd., Montreal.

pointed out, however, that salaried doctors might arrange with their employers to have certain reasonable expenses paid by the employer over and above salary as part of the terms of employment.

GENERAL PRACTITIONERS

An active and interesting discussion on the status of the General Practitioner took place both in relation to the reference to this matter in the report of the Executive Committee and in relation to the report of the Committee on Medical Education. A largely-attended meeting of general practitioners was held on Wednesday, July 23, at which it was decided to request that the Canadian Medical Association bring about the necessary changes in its By-Laws to embrace a General Practitioner Section and that these changes should allow the Section the necessary freedom to form its own executive and to allow freedom of action in education, standards of recognition, etc. General Council had previously approved a resolution to examine the advisability of so reconstituting the scientific sections as to make them meet the needs of the profession as a whole and to consider methods of bringing about greater cohesion between the various medical groups of the Canadian Medical Association.

MEDICAL SOCIETIES

Ontario Medical Association

Five life memberships were granted at the Annual Ontario Medical Association meeting. These are the citations: Malcolm Hectorson Valentine Cameron, M.B. (Tor.) 1905, has taught at the University of Toronto for over forty years, has kept up to date on current medical literature, has been a member of the Board of Directors of the O.M.A. and for many years a member of the Council of the Ontario College of Physicians and Surgeons, is a past president of Council, is medical correspondent for Ontario to the *Canadian Medical Association Journal*, is Canadian correspondent to *The Lancet*, an outstanding student.

John Allen Oille, M.B. (Tor.) 1903, M.D. (Tor.) 1904, has practised in Northern Ontario and in Toronto where he has been on the University faculty for many years, has taken an active part in postgraduate lectures to the practitioners throughout the province, was an active member of the O.M.A. committee for the study of pre-paid medical care, has continued his interest as a member of the Board of Governors of Physicians' Services Incorporated.

John Shehan, M.B. (Tor.) 1895, has practised in St. Catharines since 1896, has been a member of the Board of Directors of the O.M.A., a member of the Council of the College of Physicians and Surgeons, represents the Council on the Senate of University of Toronto, is past president of the Board of Governors of Niagara Peninsula Sanatorium.

Graham Laughlin MacDougall, B.A. 1899, M.B. (Tor.) 1910, has been a member of the Board of Directors of O.M.A. and of the Council of the College of Physicians and Surgeons, of which he has been president, recipient of the Brydon Award for outstanding medical service.

John William Cook, M.B. (Tor.) 1903, has practised in Fort William more than forty years, could always be relied on to make a call on any type of patient in the surrounding district, is an ardent fisherman, has served as president of Thunder Bay Medical Society.

Federation of Medical Women of Canada

The Federation of Medical Women of Canada, held their annual meeting in Toronto in June. The officers elected are: *Honorary President*, Dr. Margaret Cameron Gosse, Halifax; *President*, Dr. Anna Nicholson, Saskatoon; *Vice-presidents*, Dr. Pearl Hopgood, Nova Scotia; Dr. Cora Eaton, New Brunswick; Dr. Eleanor McKenzie, Quebec; Dr. Phyllis Bradshaw, Ontario; Dr. Kay Borthwick Leslie, Manitoba; Dr. Margaret Chase Collins, Alberta; Dr. Margaret Sylling, British Columbia; *Secretary*, Dr. Emma Adamson, Winnipeg; *Treasurer*, Dr. Margaret Owens, Winnipeg; *Corresponding Secretary*, Dr. Anna Wilson, Winnipeg; committee conveners; archives, Dr. Mary Eddis, Toronto; scholarship, Dr. Marion Hilliard, Toronto, Dr. Jessie McGeachy, Winnipeg and Dr. Grace Donnelly, Montreal; opportunities for medical women, Dr. Jessie Gray, Toronto, Dr. Ethlyn Trapp, Vancouver and Dr. Isobel Wright, Montreal; cancer committee, Dr. Helen Millburn, Toronto and Dr. Lola McLatchie, Calgary; overseas committee, Dr. Edna Guest, Toronto and Dr. Ellen Douglas, Winnipeg; councillors, Dr. Ellen Taylor, Winnipeg and Dr. Lillian Chase, Toronto.

During the C.M.A. meeting donations were collected for food for medical colleagues in Britain; the committee, convened by Dr. Hollie McKinnon, Toronto, sent forty-six parcels. Continuation of the overseas committee until 1950 was agreed on, this committee raises money to be sent to the British Federation of Medical Women for the purpose of giving medical education to the daughters of war victims.

Dr. Agnes Moffatt, Peterborough, past president compiled a directory of Canadian medical women. Of the five hundred women physicians registered in Canada one hundred are certified specialists.

New Brunswick Medical Society

At a largely attended special session of the executive committee of the New Brunswick Medical Society, held in St. John, July 21, the diagnosis, care and treatment of cancer was exhaustively discussed. Emphasis was laid on a possible new Provincial set up. In addition to the members of executive committee Dr. D. F. W. Porter, director of hospital services, and Dr. J. R. Nugent, Dr. R. A. H. MacKeen and Dr. A. S. Kirkland were invited to further the discussion. Dr. D. A. Thompson, President, of Bathurst, was chairman.

CANADIAN ARMED FORCES

News of the Medical Services

The arrival of *H.M.C.S. Athabaskan* in Esquimalt, B.C., on June 29, 1948 was marred by the death at sea of a crew member on the previous day from anterior poliomyelitis of the bulbar type. The *Athabaskan* was completing a voyage from Halifax, N.S., via the Panama Canal. During the period from June 29 to July 2, 1948 eleven suspicious cases were removed from the ship, of which seven were subsequently hospitalized. The ship was placed in quarantine until July 14 and, fortunately, no new cases developed.

Representatives from the Medical Services of the Navy, Army and Air Force spent two very profitable weeks (June 13 to 27) in Toronto, where they attended three conferences of great interest to the Services.

The first conference was on "The Influence of Cold Environments on Man", and was attended by investigators from the United Kingdom, United States and Canada. The discussion dealt with the physiological factors of wet and dry cold, nutritional factors and psychological factors. These discussions went far toward pointing out the gaps in the present day knowledge of the subject and in organizing an approach to study. The second conference was the annual meeting of the Aero-Medical Association, which dealt with various problems of Aviation Medicine. This conference was exceptionally well organized, and a tremendous number of problems were discussed. No less than sixteen countries had representatives at this Conference. The Aero-Medical Association, and in particular the Canadian Committee, is to be congratulated upon the success of the meeting. The third conference was the 79th Annual Meeting of the Canadian Medical Association. This meeting was not only enlightening and interesting from a scientific and professional viewpoint but proved to be one of the greatest get-togethers for the profession since the inception of the Association. Somewhat more than 2,000 doctors registered.

The Medical Services of the Armed Forces formed a panel of the Canadian Medical Association and had a very successful and well attended meeting on the afternoon of June 25, 1948. Colonel K. A. Hunter, was Chairman of the meeting and Brigadier H. M. Elder was Chairman of the Panel discussion. The following interesting papers were given: Lieut.-Col. J. N. Crawford, Medical Aspects of Arctic Warfare. W./C. W. R. Franks, Some Aspects of Atomic Warfare. Colonel M. Brown, Bacterial Warfare. Dr. O. Solandt, General Research Problems.

The M.D.G.(Navy), D.G.M.S.(Army) and D.H.S.(Air) outlined the organization and administration of their respective Services.

The post-war training of medical officers is proceeding along professional and military lines with the ultimate objective of having every officer of the R.C.A.M.C. certified as a specialist or a graduate of the Canadian Staff or National Defence College. One medical officer successfully completed his staff training in 1947 and five other officers were successful in the preparatory course this year. On the professional side, the R.C.A.M.C. already has a number of officers who possess a diploma in public health. Others have been certified as specialists in surgery, medicine or anaesthesia by the Royal College of Physicians and Surgeons of Canada. At the present time, two officers are preparing for the qualification of D.P.H., and three are preparing to write the next examination for Fellowship in the Royal College.

Full use is made of the clinical training opportunities which are offered in D.V.A. Hospitals, particularly Queen Mary's Hospital in Montreal. In addition, two assistant residencies, one in medicine and one in surgery, are held by R.C.A.M.C. officers in the 2,500 bed U.S. Military Hospital at Fort Sam Houston, Texas. The integration of Toronto Military Hospital with Sunnybrook Veterans' Hospital in Toronto, which is scheduled for next autumn, will provide further splendid opportunities for training in Canada.

In an effort to introduce medical officers to the elementary aspects of the medical effects of atomic warfare, 50 officers of the Corps will attend the five day course given by the U.S. Army School of Postgraduate Medicine commencing in September. In addition, a pamphlet on this subject is now printed for circulation to all serving Officers in the Medical Services of the Armed Forces. The civilian applications of this knowledge will be of some importance. The necessity of maintaining the highest standards of professional work in the Corps is recognized not only as a means of ensuring the best possible treatment for Army personnel, but also in order to maintain that vital liaison with the profession and attract the proper type of young doctor into the Service.

S./L. E. C. R. Purchase has been appointed as Senior Medical Officer, R.C.A.F. Station, Greenwood, Nova Scotia.

S./L. H. R. Mack has taken up a position as Staff Medical Officer, R.C.A.F. Station Hospital, Rockcliffe.

S./L. J. D. Munroe was posted as Senior Medical Officer, R.C.A.F. Station, Edmonton.

A survey was completed during the summer months of R.C.A.F. Units to determine which required anti-mosquito control measures, particularly in connection with aircraft spraying of ground areas. A full program of control measures will be carried out at the appropriate time early in 1949. This survey was carried out by the R.C.A.F. Medical Branch in conjunction with the Defence Research Board.

Fifty-four undergraduates were employed by the R.C.A.F. Medical Branch during the summer months. These students were employed with the developmental research projects which are being carried out within the R.C.A.F.

A survey has been instituted of the peacetime physical requirements of each R.C.A.F. trade. The R.C.A.F. Medical Branch is publishing this in the form of an interim report for the immediate use of medical officers who are examining R.C.A.F. personnel.

Defence Medical Association of Canada

The next annual meeting of the Defence Medical Association will be held in the Chateau Laurier, Ottawa, on Thursday and Friday, November 5 and 6, 1948. All members of the twelve branches across the country are most cordially invited to attend. Information about the Association may be obtained from the Branch Secretaries, Command and Area Medical Officers of the three Armed Services, or the Honorary Secretary-Treasurer.

CORRESPONDENCE

Planning in Health Insurance

To the Editor:

May I congratulate you upon the very able and forceful editorial of July, 1948, on Health Insurance. Far too often even amongst the profession here the attitude towards the steadily rising cost of state hospitalization is that as soon as the chronics are cleared up the rising incidence of hospitalization will cease. You could not have more forcibly pointed out how wrong this attitude was. I was very impressed with "whatever medical activity we plot against time we find the same result, acceleration towards infinity".*

May I draw your attention to an interview with Sir Charles Hereus, Dean of Medicine and for 25 years Professor of Public Health at Dunedin, New Zealand, as reported by Miss Isabel Atkinson. In the interview Sir Charles stated that "New Zealand's health insurance has been a dreadful mistake". It had put medical practice back to the 19th century. He stated that people were encouraged to consult doctors too often and for the wrong things.

Recently, just three days before the Saskatchewan election a Provincial psychiatrist, resident in Canada

* The phrase belongs to Dr. Ffrangcon Roberts, of London, Eng.—[EDITOR].

less than a year and formerly practising in New Zealand, created a local furore when he stated in an address his scientific opinion that New Zealand's health insurance had resulted in the development of a race of hypochondriacs there. The *Health Insurance Bulletin* has recently pointed out that the cost of the tenth year there is 167% of the ninth.

There seems to be only one common denominator to experiences with state-operated health insurance. It is that the moment the state takes over psychical factors enter that completely change the previous picture that existed in a democracy. I cannot but feel that plans formulated upon social and psychiatric knowledge of fifty years ago and whose basic form has not been changed in conformity with the more recent established knowledge in psychiatry and psychology are both unscientific and harmful. Weiss, in *Psychosomatic Medicine*, has stated that one-third of all illnesses for which the patient in the U.S.A. consults the doctor are purely emotional in origin; one-third, with the emotional factors activating the onset of symptoms; and one-third more or less purely organic. Others have estimated that the emotional factor is the most important in over half of all cases. Flanders Dunbar and others are pointing out that upon the patient's personality which results from his childhood experiences the type of disease he will suffer from depends. We all know the importance of the emotional factor in chorea, cardiovascular disease, gastric ulcer, hyperthyroidism, etc. J. H. Couch in the July issue of this *Journal* in writing on Plastic Surgery which not so long ago used to be considered a purely mechanical art, says: "It is easy to transfer skin from the thigh to the hand or from the arm to the face, and have a 100% take. It is not so easy to restore the (surgically healed) patient to his place in the social or economic world". It is the psychological factor that has been overlooked in establishing the form of aid used in health insurance. It is the method used to bring medical aid that is important.

Why is the method important? Simply because, according to our Saskatchewan psychiatrist and to what Sir Charles Hercus is reported to have said, when the method used to bring aid is that of health insurance and a survey is made a few years later of the reasons for the visit to the doctor, in place of the formerly one-third of cases being purely emotional in origin that third then existing has become one-half; in a few years more, three-quarters; in a further few years, five-sixths; and so "the acceleration towards infinity". At the same time as the purely functional cases increase, the other previous third of only partly emotional origin also have increased in number. It is then even more difficult to completely heal Dr. Couch's originally considered purely organic plastic case and his personality.

There is an answer to this situation that is each month becoming more apparent. It is that the method used in bringing medical aid be such that emotional maturity—the ability to stand upon one's own two feet and face the storms of life, medical included, alone efficiently—be increased, not diminished as health insurance diminishes maturity. Medical aid, as your editorial suggests, must conform to the laws of economics, but it must also conform to the laws of psychology if the aid is to improve the emotional maturity of the race, and of the profession. For if there is a steady acceleration in the use of x-rays, etc., which are medically unnecessary, is this due to increasing ability of the medical profession to stand on its own two feet of clinical knowledge and clinical experience which we all agree is the basis of good practice—professional emotional maturity—or the opposite?

There are several points further that should be emphasized. Experience has proved that on a nationwide scale the economic form aid should take is that of a cash allowance rather than that of handing out the goods and services. Of most importance is it that the plan of aid should at least make the attempt to

re-establish the recipient in a position where aid is no longer necessary. The basis of judging the amount of success the modern sociologist is having with his aid plan is whether or not the plan is improving the ability of the recipient to meet the storms of life alone successfully and the extent to which he in a given time needs less aid not more. Various extraneous factors, such as a rising cost of living, or a rising tide of unemployment greatly influence this result without changing the basic principle.

Medical aid should not vary in form from proved successful forms of aid for other fields of endeavour. It is only when the very existence of the profession and the treatment agencies are threatened by the form of aid used that they have any moral rights peculiar to them and different from those possessed by the ordinary citizen, just as the grocer has undisputed right to criticize the price a grocery aid plan will pay for groceries.

The essence of any plan of aid, medical included, if it is to aim at re-establishment of the recipient of aid is that this be the aim of the plan, *and not that the aim be to continuously increase its scope and objects* thus continuously making the recipient more and more dependent upon the aid. I sometimes think that those who advocate health insurance really basically would like to see every form of activity upon the same basis, a basis in which each citizen leans more and more upon the state.

A most important part of a successful plan of aid seems to be that it give aid in proportion to need, and that this is most successful when the form of the plan does it automatically without the necessity of administrative interference, and when equally automatically without administrative interference the aid is proportionately withdrawn as it is no longer needed. In other words, the plan must in its form encourage emotional maturity. There is only one nation-wide plan similar to this in Canada today. It is working so smoothly that it is accepted without murmur. That plan is Family Allowances.

Personally, when it became apparent that the principle of "acceleration towards infinity" applied to the Saskatchewan Hospitalization plan, I had felt that changing this plan so that it more nearly conformed to insurance principles by having the patient responsible for the first part of each account might correct in entirety this "acceleration towards infinity". However, in New Zealand apparently this is more or less already in effect, and the health insurance plan there according to their eminent authority is a "dreadful mistake".

Two years ago I suggested that our medical aid plan be based upon family allowances principles, in the form of sickness allowances. Last year, when asked to write upon family allowances in *Health* I tried to emphasize that the important thing about family allowances was that they blazed a new trail in social experiments because they incorporated the principle of automatically encouraging the recipient to stand upon her own two feet without administrative interference. I pointed out how so many of our income groups who were most in need of aid were using family allowances to buy their prepaid care. Visit any office of any prepayment of fees organization and one still finds that that office usually cashes more family allowance cheques than any other office in town, and the first part of the cheque goes for sickness protection.

Again, sir, I appeal that serious study be made of this form of aid. It is the only form in which costs do not "accelerate towards infinity"; in which emotional maturity is improved; in which creaking and explosive Dominion-Provincial relations play no part; in which doctors and treatment agencies are encouraged to manage their own peculiar business and not become for a few days each year socio-economic experts (a part they are unfitted for by tradition and training). Above all it is the only plan so far suggested which does

promise success. Again may I plead that the psychic factor be not disastrously ignored as it has been to date.

—GRIFFITH BINNING, M.B.

P.S.—Why not bring over Sir Charles Hercus? He is New Zealand's authority on Public Health. Let us hear what he as a trained public health expert has to say about their ten years' experience.

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

THE NEW ERA

Superficially the first month of the new health service has passed uneventfully; not because it is working particularly smoothly, but simply because of the Englishman's innate gift of making the best of a bad job. Fortunately there are no epidemics at the moment, but even so general practitioners' surgeries are crowded. Pharmacists are working overtime trying to keep pace with the mass of prescriptions flooding their shops. Hospital staffs are carrying on as usual, pending a final decision as to the scale of salaries to be paid to consultants. Surgeons are finding relaxation in studying the Ministry's attempts to classify operations on a financial basis, and wondering why an operation for thyrotoxicosis should be paid for at a higher scale than one for an adenoma of the thyroid irrespective of the severity of the latter from the operative point of view. The lay administrators of hospitals are just managing to keep their heads above the shoal of papers, forms and instructions with which they are being inundated, while the newspapers are full of advertisements of vacancies for finance and administrative officers of all descriptions to run the hospitals now that they are under the control of the State. Student nurses from six East London hospitals have refused to accept the proffered scale of salaries and have informed the Minister that if their request for a meeting to discuss the matter is refused they will hand in their resignations.

Out of this chaos will presumably come order, and when it does the credit will be due (though almost certainly not given) to the doctors of the country.

BRITISH MEDICAL ASSOCIATION CONFERENCE

For the first time since 1939 the British Medical Association has this year been able to hold its annual meeting on a full scale. During the war the annual meeting was merely a business session to discuss essential matters, but this year the business sessions, which lasted for several days, were followed by the traditional scientific meetings, consisting of 19 scientific sections. The meetings were held in Cambridge under the presidency of Sir Lionel Whitby, the Regius Professor of Physic in the University of Cambridge. In spite of the present day difficulties in the form of hotel shortage, food rationing and the like, the meetings were most successful, both scientifically and socially. The attendance was not as large as had been expected, but the standard of discussion at the scientific sessions was commendably high. Outstanding among these was the discussion on the rôle of sympathectomy in the treatment of hypertension, which was initiated by a brilliantly delivered paper by R. H. Smithwick of Boston, Mass.

STREPTOMYCIN

Streptomycin is still headline news so far as this country is concerned, and some recent unfortunate newspaper publicity has brought to the fore once again the problem of supplies in the United Kingdom. In reply to a short debate in the Parliament the Minister of Health has now provided some figures which should go far towards clearing up the mystery which for some

unknown reason has surrounded the subject for a considerable time. Between November, 1946, and the present time 309 kg. have been imported from the United States at a cost of \$777,000. Large-scale production is at last beginning in this country, and it is estimated that from home sources 25 kg. will be available in July, 50 kg. in August and 100 kg. per month by the autumn. As it is estimated that 40 kg. per month will be sufficient to treat all cases of miliary tuberculosis, tuberculous meningitis and tracheobronchial tuberculosis, the estimated figure of 100 kg. to be obtained before the end of the year should allow of ample supplies for clinical trials in other conditions.

A point which is not generally appreciated, even by many doctors, is that shortage of supplies of streptomycin is not the only factor responsible for its restricted use. Equally important is the absence of adequate nursing staff. To treat the more acute forms of tuberculosis, such as tuberculous meningitis, imposes a strain upon the medical and nursing staff which can only be met when their numbers can be increased. The indiscriminate and uncontrolled use of streptomycin is not without its dangers, and whilst this is a point of view which patients and their relatives cannot be expected to understand, it is one which must be appreciated by the medical profession.

AN ORTHOPÆDIC PIONEER

The death, on July 24, at the age of 81, of Dame Agnes Hunt, D.B.E., R.R.C., has removed from our midst one of the greatest characters in the history of English orthopædics. The daughter of a Shropshire squire, and herself a cripple, she founded in 1900, in an old house in her native village, an open-air hospital which is now known throughout the world as the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry. The partnership between the then relatively unknown Liverpool orthopædic surgeon and the irrepressible though crippled daughter of the country squire was irresistible, and there can be few orthopædic surgeons of standing in any part of the world who have not made a point of visiting the great hospital which now proudly bears their great names. As has been aptly said of the days when they were both at the zenith of their power, "Robert Jones performed the operation while Miss Hunt performed the rest"! Rehabilitation was one of the many catchwords not yet invented in those days, but no one has appreciated its full potentialities and applied it more effectively than Dame Agnes Hunt did with her crippled children. *The Times* has well summed up her unique contribution to orthopædics, and particularly the care of crippled children: "The will to have physically defective children cured, if surgery and care could do it, was incarnate in one woman on crutches, whose courage and determination have shown that this can be done without vast expenditure, if only the people who do it will but spend themselves, and inspire their staffs to do likewise". WILLIAM A. R. THOMSON

London, August, 1948.

The Australian Letter

(From our own correspondent)

Since the last letter there have been many conferences on the vexed matter of Free Medicine (meaning free drugs) between the B.M.A. and the Federal Government. Two things seem clear: (a) the demand by the public for free medicines has not been heavy since the scheme started on June 1; (b) the few physicians who have used it consistently, claim that there are few if any drugs in common use which cannot be found in the official Formulary put out by the Government. Still the central question remains of the power of any government to limit a doctor's efforts to discharge his duty to his patients as he sees it. The Federal Government is gradually entering the field of medical practice in the latest developments whereby trained pathologists will be made available at strategic

places in rural areas to assist with diagnosis. All tuberculosis care is being taken over by Canberra, and mass radiological studies are being projected. The Commonwealth Government, by paying hospitals a per capita rate equal to what was once paid on the average by patients as ward fees, has made public ward care free everywhere. Some sectarian hospitals have not joined in this scheme.

Once again the mental hospitals are being given the most searching newspaper criticism, this time in New South Wales. The situation is not without interest to Canadians insofar as staff shortages are concerned. The state of New South Wales has approximately 12,000 mental beds, and a total medical staff of 34 doctors. At some of the state hospitals the number of nurses is half that required for the efficient functioning of the wards. Newspaper publicity has been largely directed to the actual day to day situation of the patients, in the matter of clothing, sanitation, and personal necessities. Little has so far been said about the medical problem presented by this staggering group of cases for whom care and maintenance only can be attempted with the present short staffing. Domestic staffs are being augmented where possible with immigrants from the Baltic countries. There has been considerable difficulty in the registration of nurses from England, with the result that the Minister for Immigration has refused to allot any further passages to nurses unless they are first guaranteed registration before leaving England. Immigrant doctors from Europe are required to take a minimum of three years in the undergraduate medical schools here before practicing.

A National University at Canberra, the Federal capital, has been approved in principle for some years, and an institute of anatomy has existed at Canberra. Recently it was decided to greatly expand the early beginnings and to this end invitations were sent to several well-known Australians in England to return to head up the work. Among these were Sir Howard Florey, to direct medical research, and Professor Oliphant in atomic physics. It is expected that no building will be possible for five years due to the critical shortage of materials in Australia.

The new buildings of the Medical Faculty at Adelaide in South Australia are nearing completion. Similarly, the medical school of the University of New Zealand, at Dunedin has a new building.

Dr. Robert Morrison of the Rockefeller Foundation has just completed an intensive survey of medical education in Australia and New Zealand and has returned to New York.

Invalids, sick persons and children under the age of four have been exempted under the stringent rules governing the use of electric heaters or gas fires imposed last month in view of the critical coal shortage affecting the major centres in Australia. A fine of £500 has been set for infractions of the rules, with the result that the almost total lack of central heating in such states as New South Wales has combined with the present severe influenza epidemic to further curtail industrial output.

W. C. GIBSON

2 Clairvaux Rd.,
Vaucluse, Sydney, N.S.W.

Reform (in medical education) is a question not merely of adding to the curriculum here and subtracting from it there, nor is it to be solved by the provision of new buildings and by the subdivision of departments, nor again is it concerned exclusively with the furtherance of research. It is a search for unity and synthesis in a subject which has a natural tendency to disunity and dispersion, a search for the ideal combination of science and empiricism; above all, a search for a solution which needs no periodic stimulation, but which being based on fundamental principles, automatically keeps itself alive. — *Medical Education*; Ffrangcon Roberts, M.D.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Injection Therapy for Angiomas. Crawford, G. M.: *J. Am. M. Ass.*, 137: 519, 1948.

While not claiming that this method of treatment is best for all cases the author considers that in view of its simplicity, efficiency and freedom from hazard it deserves more emphasis than it has in the past received. Although there is a pronounced tendency to spontaneous regression in the early years of life certain types of lesion present reasons other than purely cosmetic for intervention. Lesions interfering with vision, in or about the mouth, in the anogenital region or on pressure areas demand treatment. Large lesions of the more superficial type are prone to ulceration exposing the patient to infection, and scars may be disfiguring. Excision in selected lesions is a quick and satisfactory method of treatment but is open to a number of objections. Radiation therapy is the method most widely employed, but hazards and limitations exist. It should not be employed after 2 years of age, and in the senile type of cavernous angiomas which appear after middle life, usually on the head, radioresistance is notable. The author is opposed to the use of radiotherapy on the scalp, around the eyes, lips, genitalia or breasts and over bony prominences. He considers that possible radiation sequelae on deeper structures should be kept in mind. Solid carbon dioxide, a popular and efficient method in the superficial angiomas, is not a satisfactory modality for use on cavernous lesions.

In a series of 190 patients treated with sclerosing injections all but 12 were treated with 30% sodium citrate, 5% monoethanolamine in 2% benzyl alcohol, or 30% invert sugar with the addition of 10% sodium chloride and 1% phenylethyl alcohol. The sodium citrate was replaced early in the series by the two latter agents, and half of the cases were treated with the monoethanolamine, but this was not shown to be appreciably more efficient than the invert sugar. A 24 or 26 gauge needle of sufficient length in proportion to the size of the lesion to require a minimum number of punctures was used. The injection was made either directly into the lesion or through the skin at its periphery. Hemorrhage was always readily controlled by firm pressure for 2 or 3 minutes. The quantity of solution instilled at the first treatment varied from 0.05 to 0.5 c.c. The amount was governed somewhat by the size of the lesion, but also by the pressure or absence of an allergic family history. The increase in quality was rapid with additional treatments if the lesion was large, and the operator was guided in determining the frequency of treatments by the relative activity of the tumour and its response to treatment. They varied accordingly from weekly to intervals of 1 to 3 months. Too superficial deposition of the fluid will nearly always result in sloughing. Blanching indicates that the needle must be moved to another portion of the tumour. Local reaction from a preceding treatment or absence of residual reaction but firmness throughout the tumour is an indication for postponement of a treatment. Haste is not necessary once growth has been arrested. When the lesion is accessible from either a cutaneous or a mucous membrane surface the injection through the latter produces less discomfort.

D. E. H. CLEVELAND

Sarcoidosis. A Review and an Appraisal. Michelson, H. E.: *J. Am. M. Ass.*, 136: 1034, 1948.

The author prefers the term sarcoidosis to sarcoid and other proposed names as it implies a wider distribution than sarcoid and emphasizes systemic involvement. It has the characteristics of a chronic, systemic, benign infection. While clinical diagnosis is unreliable, and the positive diagnosis rests ultimately on the histo-

logic findings, and while Michelson is emphatic in insisting that it is more than a cutaneous disease, no examination in suspected sarcoidosis is complete without searching for cutaneous and mucosal lesions. Since internal lesions usually are asymptomatic the first evidences are found in the skin. Every type of cutaneous change from erythema to tumour formation is found, hence polymorphy in this organ must be stressed. On account of its frequent close resemblance to other skin diseases microscopic examination is essential. Superficial and internal glands and lymph nodes are affected, and when ductless glands are invaded interference with their function may produce symptoms. The contents of the thoracic cavity and the liver may indicate their involvement by the evidence furnished by x-ray or liver puncture, but extensive involvement of lungs, pleura and hilar nodes may be asymptomatic. Classic sarcoidosis structure is readily identified by the pathologist, but even this may appear as a response to various infections such as tuberculosis, lepra and brucellosis and foreign body reaction, so a complete clinical review must be taken into consideration in making the diagnosis. Tuberculosis is more selective in organ involvement than sarcoidosis; involvement of an organ system is the exception in tuberculosis. Untreated tuberculosis progresses if ignored, but sarcoidosis ignored does as well or better than with medical intervention. The etiology of sarcoidosis is as yet unknown. The theory of tuberculous causation is a popular one but bacteriologists have failed to present sufficient convincing evidence to support it. The alternate theory is that the disease has its own separate etiology.

D. E. H. CLEVELAND

Ineffectiveness of Aluminum Subacetate in Rheumatoid Arthritis. Blazer, A., Friedman, H. H. and Steinbrocker, O.: *New England J. Med.*, **238**: 507, 1948.

Helfet reported favourable results in treatment of rheumatoid arthritis through the employment of aluminum salts by mouth. He considered the disease to be analogous to hyperparathyroidism, the major fault being an over-production of parathormone with resultant bone decalcification. The aluminum salt was used to combine with the phosphate of the diet to form insoluble compounds in the bowel and so prevent a rise in blood phosphate. The authors repeated this treatment in twelve cases carefully followed over periods of from one to two years. Only two patients improved and evidence of bone recalcification was demonstrated in only one case. Blood calcium and phosphorus levels were unaffected by the treatment. It is concluded that aluminum salts have no value in the treatment of rheumatoid arthritis.

NORMAN S. SKINNER

The Diagnosis of Mitral Insufficiency in Rheumatic Children. Kuttner, A. G. and Markowitz, M.: *Am. Heart J.*, **35**: 718, 1948.

The authors are concerned with the criteria for a diagnosis of mitral insufficiency in children. They note that in the criteria published by the New York Heart Association, it is stated that without cardiac enlargement, deformity of the mitral valve should not be diagnosed. In children with a fairly loud blowing apical systolic murmur, even in the absence of detectable cardiac enlargement, a diagnosis of mitral insufficiency is frequently made. To test the justifiability of such a diagnosis, they approached the matter from a viewpoint of prognosis. Their study comprised 315 rheumatic fever patients between the ages of 6 and 15 years. Group 1 consisted of 171 patients who showed a soft, poorly transmitted apical systolic murmur. These cases were classified as being potential and possible rheumatic heart disease. Group 2 consisted of 144 patients, diagnosed as having mitral insufficiency because of the presence of a loud, blowing systolic murmur, maximal at the apex and well transmitted to the axilla. In neither group of patients was

there cardiac enlargement. The study was based on an average follow-up period of eight years.

Of the 171 patients in group 1 the diagnosis in 87% remained unchanged at the end of the follow-up period. Thirteen per cent developed definite cardiac lesions. However, in group 2, 69 or 48% of those diagnosed as mitral insufficiency have developed further evidence of rheumatic heart disease. Twenty of these children have died—13 due to rheumatic infection and 7 due to bacterial endocarditis. Between group 1 and 2 there was no difference as to the type of initial infection, but in group 2, twice as many children gave a history of repeated rheumatic occurrences. The authors feel that the evidence presented indicates that the intensity of the apical systolic murmur is a valuable prognostic sign, and despite the absence of demonstrable cardiac enlargement, indicates organic damage.

ARNOLD L. JOHNSON

Problem of Sulfonamide-Resistant Hemolytic Streptococci. Hartman, T. L. and Weinstein, L.: *New England J. Med.*, **238**: 560, 1948.

The authors found only one sulfonamide-resistant organism among 167 strains of hemolytic streptococci isolated at the Evans Memorial and Haynes Memorial Hospitals, Boston, during the fall and winter of 1946-47. The literature on the subject is reviewed and it is concluded that a sulfonamide-resistant streptococcus is only likely to arise as a mutation during sulfonamide therapy, and would constitute a medical problem only where a large proportion of the potential hosts were under treatment with the drug in question. Because of this possibility large-scale mass prophylactic programs should be used only as an emergency measure.

NORMAN S. SKINNER

Repair of Hiatus Hernia of the Diaphragm by the Supradiaphragmatic Approach. Sweet, R. H.: *New England J. Med.*, **238**: 649, 1948.

In the majority of cases it is technically much easier to repair a hiatus hernia from above the diaphragm. Handling of the abdominal viscera is largely avoided and recurrence is much less frequent than when operation is done through the abdominal cavity. No deaths occurred in 51 patients operated upon transthoracically. Five developed postoperative complications (thrombophlebitis of leg veins in three, localized empyema requiring drainage in one, and one case of minor, superficial wound infection). X-ray study demonstrated one possible slight recurrence of herniation which was asymptomatic. Postoperative chest pain was not significant.

NORMAN S. SKINNER

Roentgenographic Studies of the Gastro-intestinal Tract Following Section of the Vagus Nerves for Peptic Ulcer. Ritvo, M. and Shauffer, I. A.: *New England J. Med.*, **238**: 496, 1948.

Roentgenographic studies were made in 33 peptic ulcer patients who had been treated by section of the vagus nerves. During the early postoperative stage most cases showed gastric dilatation and atony, associated with very poor peristalsis and marked delay in gastric emptying. These changes were less evident in three patients with gastroenterostomies and in five with partial gastrectomies, these operations having been unsuccessfully employed as measures of treatment well before the period when vagotomy was considered. The degree of gastric dilatation following section of the vagi was so extreme in two cases as to necessitate subsequent gastroenterostomy.

Gastric motor function improved as the months passed after vagus section but no case showed a complete return to normal, the longest period of follow-up being fourteen months. Ulcers healed promptly, however, especially the stomal and jejunal ulcers in the patients with previous partial gastrectomies. No small

bowel abnormality was noted apart from slow motility which was considered the direct result of delayed gastric emptying.
NORMAN S. SKINNER

Treatment of Arterial Embolism. Warren, R. and Linton, R. R.: *New England J. Med.*, **238**: 421, 1948.

Arterial emboli usually occur in middle-aged cardiac patients and most commonly lodge at the bifurcation of a major artery, particularly at the femoral bifurcation. Possible sources of arterial emboli are the pulmonary veins; mural thrombi in the heart; mitral valve vegetations; atheromatous plaques in the aorta and, very rarely, the systemic veins or the right side of the heart via a septal defect. A closing ductus arteriosus may be the originating point of an arterial embolus in childhood. In the present series of 98 patients who suffered 172 arterial emboli at the Massachusetts General Hospital during the period 1937 to 1946 the site of lodgement was in the limbs in 63.9%. The source was considered to be from within the heart in 88.7%. Auricular fibrillation with presumed auricular thrombus was the major cause. Surgical embolectomy is the treatment of choice and should be carried out within ten hours of onset. The principal conservative methods of treatment are paravertebral novocain block; intermittent venous occlusion; the oscillating bed; heparin and papaverine.

The authors stress the fact that whether surgical or conservative methods are employed treatment should be instituted promptly and carried out energetically.
NORMAN S. SKINNER

Obstetrics and Gynaecology

Aberrant Endometrial Tissue and Intussusception. Southern, E. M.: *Brit. M. J.*, **1**: 1178, 1948.

A case of intussusception, with tissue showing all the appearances of endometrium situated at the apex of the entering ileum is presented. The microscopical appearances are suggestive of a metaplastic origin of the endometrial tissue and may be held to support the observations of Meyer and Kitai (1924), Novak (1926, 1947), Moench (1929) and others.
ROSS MITCHELL

Neonatal B. Coli Meningitis After Prolonged Labour. Duval, H. R. and Burrowes, J. T.: *Brit. M. J.*, **1**: 1180, 1948.

A short review of the literature is made with particular reference to the portals of entry of *B. coli* infection which leads to *B. coli* meningitis in the newborn. The history of a fatal case of *B. coli* meningitis in an infant of 3 days is given. The mother had intrapartum eclampsia and prolonged labour, and on the third day of the puerperium developed *B. coli* pyelitis and endometritis. The dangers of prolonged labour, from the point of view of the child, are stressed.
ROSS MITCHELL

Phenolsulphonphthalein as a Test for the Determination of Tubal Pregnancy. Speck, G.: *Am. J. Obst. & Gyn.*, **55**: 1048, 1948.

Phenolsulphonphthalein is instilled into the uterine cavity and, at the end of thirty minutes, the bladder is catheterized. If the uterine turns red or pink when alkalinized, the tubes are considered patent; if there is no discoloration the tubes are considered closed. This test is neither costly nor dangerous and can be easily performed by all.
ROSS MITCHELL

Treatment of Pelvic Endometriosis. Schmitz, H. E. and Towne, J. E.: *Am. J. Obst. & Gyn.*, **55**: 583, 1948.

Pelvic endometriosis occurs most frequently in the childbearing period and is a major cause of sterility. Conservative treatment which will increase the possibility of conception is, therefore, the most desirable form of therapy. A review of 130 cases treated with

this intent shows that 57 or 43.9% were treated by surgical procedure; 10 or 17.6% required radical surgery (removal of both ovaries with or without the uterus); 47 or 82.4% had one or both ovaries preserved, and 11 later conceived, giving birth to 13 infants, an incidence of 23.6% or a corrected incidence of 27.5%.

X-ray therapy was employed in 29 cases, of which 17 were given sufficient dosage to cause a permanent menolysis. Twelve were treated with smaller dosage causing a menolysis of from three to eight months. In this group two conceived and delivered three infants, an incidence of conception of 16.6%. X-ray therapy in this group proved satisfactory for secondary therapy when conservative surgery had failed. X-ray therapy of sufficient intensity to destroy ovarian function is indicated in cases where endometrial tissue has invaded the bowel or bladder. It obviates the necessity of surgical resection with its increased risk. Watchful expectancy or male hormone therapy is of value in cases with minimal disease and symptoms in young women. It enables one to postpone more radical procedures to the years when such therapy is less costly.
ROSS MITCHELL

Dermatology

Treatment of Eczema (Atopic Dermatitis) in Infancy.

Glaser, J.: *J. Am. M. Ass.*, **137**: 527, 1948.

While not the most common, eczema or atopic dermatitis is the most important disease of infancy and childhood, and it is important that it should be distinguished from the more common seborrhœic dermatitis and other forms of eczematous dermatitis due to varying causes, for it indicates that one is dealing with constitutional allergy. It is a disease which is usually self-limited and has a tendency to spontaneous remissions and eventually recovery. It is impossible to predict which cases will "outgrow" the disease, and which will persist throughout life with cutaneous or other system-manifestations such as asthma. With every effort made to clear the child's skin and keep it clear psychic trauma in later years may be avoided. It is even possible that a tendency toward clinical mutation into other exhibitions of allergy may be checked by yearly establishment of a suitable general regimen. The observation that the incidence of eczema is lowest among breast-fed infants, and is 7 times as great among those completely artificially fed indicates one prophylactic procedure which should be urged strongly in allergic families.

It was formerly believed that ingested allergens played the most important rôle in eczema but this is no longer regarded as a certainty, and transepidermal penetration of allergens and inhalant allergens are of greater importance. Probably contact dermatitis has more in common with atopy than has been recognized in the past. Although positive evidence is lacking to support the common belief that house-dust may cause dermatitis, an environment as dust-free as possible is an important therapeutic and prophylactic factor. Other commonly and probably justly suspected agents are dusts and fibres of animal origin, dyes and soaps. The author considers that soap should invariably be replaced with sulfonated oils, or the wetting agents derived from lauryl alcohol. For general bathing the familiar colloid bath or tar baths made with 2 cupfuls of liquor carbonis detergens added to the tub are useful. In the acute exudative stage 0.5% solution of aluminum acetate in a 1 to 20 dilution or potassium permanganate in 1:5,000 to 1:10,000 dilution are recommended. For the subacute and chronic stages tar-containing ointments are the most effective medication. For a vehicle zinc paste, proportioned of 1 part each of zinc oxide and starch and 2 parts of soft paraffin is considered most satisfactory. The author favours the trial of a simple elimination diet, which is outlined, in most cases, and considers that scratch testing is sometimes of use.

For systemic medication the so-called anti-histamine drugs have been tried for their effect in controlling itching, but this is usually inconstant and variable.

As a deficiency of unsaturated fatty acids has been shown to exist often in atopic dermatitis, these are recommended in the form of soy bean oil or lard as a therapeutic adjunct.

Vaccination against smallpox should not be undertaken until the skin is perfectly clear but routine prophylactic treatment for diphtheria, pertussis and tetanus should not be avoided, reactions being no commoner in allergic than in non-allergic children. The courses may be started with but a fraction of the orthodox dose and continued until the required amount is given. Immunization and consequent avoidance of any later necessity for the antitoxins is important in diphtheria and tetanus. Hypoimmunization against pertussis is also important since respiratory allergies are more apt to follow pertussis in an allergic child.

D. E. H. CLEVELAND

Permanent Wave Process. Clinical Report with Special Reference to the Effect of Ammonium Thioglycolate on the Skin. Goldman, L., Mason L. and McDaniel, W.: *J. Am. M. Ass.*, 137: 354, 1948.

In view of the extensive use of cold waving solutions this report from the Kettering Laboratory of Applied Physiology of the College of Medicine of the University of Cincinnati is of considerable importance. Dermatitis of the scalp of patrons and of the hands of operators in beauty parlours is commonly met with and ascribed rightly or wrongly to the cold wave solution. The essential feature of the cold wave process is the dampening of the hair, which is wrapped around a rod of suitable diameter, with an alkaline reducing agent, usually thioglycolate. The wave is later fixed by the application of an oxidizing agent. No heat is used. Dermatitis has been observed on the scalp following this process and it is suggested from experiments that thioglycolate is a mild cutaneous irritant if applied undiluted over a prolonged period, acting as such more frequently than it acts as a sensitizer resulting in allergic dermatitis. The possibility of systemic toxicity resulting from cold waving has been considered and it is concluded that this does not result if the usual directions for its use are carefully followed. The cold wave process involves however the application of many things beside the ammonium thioglycolate solution which must be considered in investigating dermatitis following a cold wave. These are the materials used in the preliminary shampoo, the preliminary cleansing lotion, the oxidizing agent, the post-treatment shampoo material, the wave-setting material, perfumes, etc. Some of these are apparently more apt to produce allergic dermatitis. Dermatitis from ammonium thioglycolate inflicts cutaneous damage on the hands of operators much more frequently than on the scalps of patrons. It is not possible to protect their hands, since the hands, especially the left, are continuously dampened by the solution, and operators refuse to wear rubber gloves, and instead of exercising every precaution possible, as recommended by the authors, place undue dependence on so-called protective cream. Since an essential feature in the production of dermatitis by direct irritation from ammonium thioglycolate is prolonged exposure to a low dilution or undiluted material patch and similar contact tests are seldom of practical use. A detailed set of prophylactic instructions in the use of ammonium thioglycolate for patrons and operators is given.

D. E. H. CLEVELAND

Industrial Medicine

Pest Control with Sound Waves. Frings, H.: *Pests*, 16: 9, 1948.

That the Pied Piper of Hamelin with his ultrasonic flute may have been "on the beam" is suggested by the author of this article in which he discusses ultrasonic waves as a possibility in the future of rodent and insect control. That many animals can actually hear ultrasounds, and that certain animals can use

them, is known. Bats can utilize them as a form of radar to guide their nocturnal flight. In view of possible uses in pest control it is important to determine their effects on animals which do not directly use them.

Newspaper reports that ultrasonic frequencies can be repellent to various insects and to birds have been unfounded. Experiments however have demonstrated the lethal effects of ultrasonic waves of great intensity in water, on living things and on micro-organisms, and, more recently, the effect of ultrasonic waves in air acting directly on air-inhabiting animals. The latter experiments have shown that high intensity air-borne ultrasonic waves, because of their great energy content, can produce great mechanical injury to small animals or thin structures, such as wings and external ears of mice, and can be absorbed by living animals or by their external coverings with the production of heat of destructive intensity. These facts give reason to believe that ultrasonic waves may have value in pest control, either as repellents which are unnoticeable by man or as killing agents. It has been reported that wild rats will attack the sound sources, so apparently the sounds have some effect on them. Reference is made also to the fact that ultrasonic waves can travel as well or in some cases, even better through solids and liquids than through air. This opens interesting prospects for their use in termite and powder post beetle control.

Before ultrasonic waves can be put to practical use, certain problems must be solved. It will be necessary to determine the ultrasonic frequency or combination of frequencies which are effective and the possible effects of fatigue or adaptation to these. The problem of attenuation is also important although there is no indication that great intensities are needed for repellency. Another difficulty is the production of sound shadows at high frequencies. For this reason it would be useless to train a siren sound-beam down a rat hole to cook a rat because the waves would not go around the turns. There is also the question of heating. Not only does heating of the animals occur in a high intensity ultrasonic beam, but heating of other objects occurs also. The author is of the opinion that research by physicist and engineer can and will aid in solving these present problems.

MARGARET H. WILTON

OBITUARIES

Dr. James Bryce Brown died at his home in Toronto on June 16, in his 65th year. He attended Paisley high school, Royal Military College and University of Toronto, where he graduated in medicine in 1908. He practised in Elmwood, Ont., for five years, going to England in 1913 for a postgraduate course. During the first great war he served in the Mesopotamia campaign, returning to Toronto after the war to be a general practitioner until he retired. Surviving are a brother and four sisters.

Dr. George Harold Carlisle of Winnipeg died on July 4, aged 66. Born at Peterborough, Ont., he graduated in medicine from Trinity University, Toronto in 1905 and after postgraduate work practised first at Brandon and later for 36 years at Winnipeg as a specialist in eye, ear, nose and throat disorders. During the first world war he enlisted with the 79th Battalion, Glen Campbell's Scouts, holding the rank of major, and later transferred to the 107th Battalion. To obtain service in France, he reverted to the rank of captain. He is survived by his widow, one son and one daughter and four grandchildren. Dr. Murray Carlisle of Grand Prairie, Alberta, is a brother.

Dr. William J. Cook, a graduate of McGill University, class of 1904, died July 19, at his summer home at Lake Penage. M.O.H. for Sudbury for 33 years, he was succeeded in 1940 by his son, Dr. J. Bernard Cook.

A native of Marmora, Dr. Cook came to Sudbury upon receiving his degree. After postgraduate work in England, he obtained his L.R.C.P. and M.R.C.S. Surviving are his widow, Dr. Faustina Kelly-Cook; two daughters, one son, four sisters and one brother.

Dr. Mervyn Homer W. Fizzell, aged 61, of Calgary, passed away on July 25 at his home. Dr. Fizzell was born in Bradford, Ont. He was a graduate in medicine of Queen's University. Following his graduation Dr. Fizzell practised at Loverna, Sask., Sylvan Lake, Alta. and Edson in 1936. In 1942 he joined the staff of the Colonel Belcher Hospital in Calgary and held that position until recently. Many reports of his many kindnesses and valuable work done are frequently heard since he has passed from the profession.

Dr. Alvan Foote Foss died at his home in Westmount July 4, after a long illness. He was 78. A graduate of McGill University in 1897, Dr. Foss specialized in anaesthesia and was for many years Chief anaesthetist at the Montreal Children's Hospital. Dr. Foss was born in Sherbrooke and practised in Lennoxville, Black Lake, Thetford Mines and St. Lambert. At the outbreak of the First Great War he enlisted in the medical corps and served overseas as medical officer with the First Division, 24th Battalion, Royal Montreal Regiment. On his return to Canada he opened a practice in Montreal. Survivors include his widow, a son and a brother.

Dr. A. Galloway died at the home of his son in Cannington, Ont., on June 24, at the age of 86. He retired 10 years ago and has lived at Cannington since. Born near Beaverton, Dr. Galloway graduated from the University of Toronto and started practising at Glenarm. Seven years later he moved to Woodville. Surviving are his widow, two sons, a brother and a sister.

Dr. B. D. Gillies, aged 73, died in Vancouver on July 6. Dr. Gillies came to Vancouver in 1906 and for many years, until his retirement in 1945, was associated with the Vancouver General Hospital. He was a life governor of the hospital. He graduated from McGill University in 1898. Survivors include a son and a brother.

Dr. William John Moore McFetridge died in Winnipeg on July 29 at the age of 46. Born in Douglas, Man., he was educated in Minnedosa and graduated in medicine from the University of Manitoba in 1927. He practised in Winnipeg from that date till 1939 when he joined the R.C.A.M.C. During the battle of Britain he was attached as Medical Officer in the Royal Air Force. At the end of the war he returned to Canada and practised at Ocean Falls, B.C. A short time ago he came to Winnipeg. He is survived by his widow and a son.

Dr. Fraser MacGregor died suddenly at his home in New Glasgow on July 3. He was born at MacLellan's Brook, Pictou County, and after a period of two years' study in the Faculty of Arts and Science at Dalhousie University he proceeded to McGill University where he graduated in 1917. During World War I he held the rank of Captain in the R.C.A.M.C. Following the war he pursued postgraduate work in surgery in the Montreal General Hospital for a period of four years. At the end of that time he began practice as a surgeon in the town of New Glasgow. About seven years ago he was compelled by ill-health to limit his practice greatly and during the past three years he was unable to undertake any active work. During his years of practice he was a prominent member of the staff of Aberdeen Hospital, New Glasgow, which has benefited by his will.

Dr. Frederick William MacKinnon died at the Ottawa Civic Hospital on July 17. He was 74. Born at Vankleek Hill, he graduated from McGill University

in 1897. He had been on the staff of Ottawa Civic Hospital ever since the hospital opened in 1924. Before that he was a surgeon on the staff of old St. Luke's Hospital. He had interned at St. Luke's and following his internship was appointed physician for the old Canada Atlantic Railway. Later, he was physician for the Canadian National Railways and the Chateau Laurier. He is survived by his widow and a daughter.

Dr. Walter N. Miner of Calais died at his home on July 15. Dr. Miner was born in New Brunswick in 1872. His early education was obtained in New Brunswick. He graduated in Medicine from Baltimore Medical School and did postgraduate studies at Johns Hopkins, Guys Hospital London, and at Edinburgh University. He practised in Calais from 1899 till 1946, operating his own hospital, which he presented to the town of Calais in 1946. He was a charter member of the American College of Surgeons and a member of the Maine Medical, N.B. Medical Society and the C.M.A. Dr. John Miner of Calais is a son.

Dr. F. G. E. Pearson, aged 78, died suddenly on July 6 in Brantford, Ont. A native of Rockford, Norfolk County, where he was born in 1870, he came to Brantford from Weston in 1894. Surviving are three brothers and one sister. Dr. Pearson was a member of Brant Ave. United Church.

Le Dr Jérémie Poirier est décédé le 20 juin à Sainte-Adèle, Que. Agé de 72 ans, il avait été maire de ce village laurentien, où il avait pratiqué la médecine pendant 40 ans. Il laisse quatre filles et une sœur.

Dr. Wilfred H. Robertson died at his home in Toronto on July 2, from a heart attack. He was in his 66th year. The son of the late Dr. Hugh R. Robertson, professor of anatomy at Trinity Medical College, Toronto, and its representative on the senate of the University of Toronto, he was born in Toronto and was educated at Jarvis Street Collegiate and University of Toronto where he graduated as a doctor in 1909. After serving as a captain in the Canadian Army Medical Corps at base hospitals in Toronto and Halifax during the First Great War, he returned to Toronto and resumed his practice. He was still practising at the time of his death and was an associate doctor at Toronto Western Hospital, where he took his internship. He had many hobbies, among them golf, stamp collecting and travel. Surviving are his widow, two sisters and a brother.

Dr. Ernest Rousseau of Three Rivers, Que., died on July 2 at his summer home in the Banlieue. He was 43 years of age and was laboratory chief of the St. Joseph Hospital. He had followed a special course earlier this summer at the Johns Hopkins Hospital, Baltimore and on returning to Three Rivers had failed to rally from an illness for which he had been under treatment. Dr. Rousseau was a vice-president of the Three Rivers Medical Society. During the war he directed the Red Cross Blood Clinic and was also President of the local Playgrounds Association.

He is survived by his widow, one son and one daughter as well as one brother.

Dr. Murray P. Smyth, aged 27, died in Sunnybrook Hospital Toronto, on July 13. Graduating from the University of Toronto in 1944, he went overseas with the Royal Canadian Army Medical Corps. Born in Big Valley, Alberta, he received his early education there and attended Regiopolis College in Kingston upon graduation from Humber College. He was a member of the Mississauga Golf Club. He is survived by his parents and a sister.

Dr. Andrew Park Stirrett, aged 83, head of the mission forces in Nigeria, Africa, died July 9 in the hospital he founded there. Born in Camlachie, Ontario,

Dr. Stirrett gave up a successful practice here about 50 years ago to dedicate his life to mission work in Africa. Except for world lecture tours he has remained at his post since 1900. He concentrated on finding a cure for native diseases and his successful work in treating sleeping sickness and other tropical diseases won him fame through the medical journals of the world. "His was a great personal sanctity," said a spokesman for the mission. "He was great enough to be called a saint." He is survived by a sister.

Dr. Victor Trottier died at his home in Windsor, Ontario, June 12, after a brief illness. Born at Lacolle, Quebec, he graduated from the University of Western Ontario Medical School in 1907, and practised in Windsor for 30 years.

Dr. Albert Beverley Welford died in Alexandria, Virginia recently. He graduated in Medicine from the University of Toronto in 1880.

NEWS ITEMS

Alberta

The Parsons Clinic of Red Deer and the Smith Clinic of Camrose have been completed and are functioning very efficiently. These and other groups of medical men are doing fine work for the benefit of the surrounding areas.

Dr. R. R. McLean, formerly Superintendent of Ponoka Mental Hospital has been made Director of the Mental and Social Hygiene Department for the Province of Alberta. Dr. T. Michie was appointed to the position vacated by Dr. McLean. Dr. Michie is a graduate of the University of Alberta and following three years in medicine at the Mayo Clinic went on the staff of the Ponoka hospital.

The annual medical golf game was held in Edmonton in June and a fine time was had by all, even though the members did not always stay on the fairways.

Dr. C. B. Rich has returned by air from London, England where he has spent some time in special cardiac centres overseas.

Preparations are being made for the Annual Alberta Medical Association convention which is being held in Calgary this Fall.

Many of the profession in Alberta are on their holidays and are spending their time at Banff, Jasper or at one of the numerous and beautiful lakes of the Province.

W. C. WHITESIDE

British Columbia

The compulsory hospitalization plan of the British Columbia Government is gradually taking shape. The Government has issued its preliminary notices for registration which has to begin soon. Every British Columbia citizen must register—single men and householders, the latter registering for their dependents. The fee will be \$15.00 for single men or women, without dependents—\$24.00 for heads of families with one dependent, and \$30.00 for those with more than one dependent.

The next step will be the publication of methods and places of registration. The annual contribution may be made in one sum or by instalments, but the payment must be completed by next spring. The plan will go into operation at the beginning of the year.

One statement made by the authorities in connection with this hospitalization plan would seem to invite questions. This is to the effect that British Columbia has more hospital accommodation per capita than any other Province, namely 6 beds per 1,000 of population, as compared with 4.5 beds per 1,000 for the rest of Canada. Whether this is true or not, it is a fact that there is a woeful shortage of hospital beds in the Province, and we know of no centre of any size where there is an adequate supply. Under a compulsory hospitalization plan, the shortage, one would think, is bound to be rendered even more acute. Perhaps the grants made by the Federal Government, and present plans for increasing hospital accommodation, will solve the problem, but the solution cannot be reached for some years.

The Annual Meeting of the British Columbia Medical Association will be held in Vancouver on September 29 to October 1. Plans are now being made for it, and a very strong slate of speakers has been prepared. The speakers are as follows: Dr. Louis Berger, Quebec, Professor of Pathology, Laval University; Dr. E. F. Brooks, Toronto, Assistant Professor of Medicine, University of Toronto; Dr. A. D. McLachlin, London, Professor of Surgery, University of Western Ontario; Dr. William Magner, Toronto, Assistant Professor of Pathology, University of Toronto; Dr. J. D. Adamson, Winnipeg, Professor of Medicine, University of Manitoba.

The Vancouver Medical Association celebrates its fiftieth anniversary this year, and preparations are now in hand for marking this anniversary by a dinner and other functions, to be held in December. At the dinner to be held on December 2, the J. M. Pearson Memorial Lecture will be inaugurated. This is in honour of Dr. J. M. Pearson, who was one of the main founders of the Association and its library; following his death some years ago, a fund was established, and the Lecture-ship inaugurated. This will be the first Pearson Lecture, and Vancouver has been fortunate in securing as the Lecturer, Dr. J. S. L. Browne of the Medical Department of McGill.

The medical profession of Vancouver, and indeed of British Columbia, sustained a severe loss in the death of Dr. B. D. Gillies recently. Dr. Gillies had been in practice in Vancouver since 1906 and was one of the leading internists of that city. He was formerly resident pathologist at the Montreal General Hospital, and had a distinguished career in British Columbia as consultant and internist.

J. H. MACDERMOT

New Brunswick

Dr. G. W. A. Keddy is doing a short course of post-graduate study in Surgery in Montreal.

Sir Wm. Fletcher Shaw of Manchester, England, while a guest of Dr. Geo. White in Saint John, appeared as guest speaker at a special summer meeting of the Saint John Medical Society. He spoke on "Medical affairs in England at the present time", and his personal opinions showed another aspect of the medical picture in England somewhat in contrast to the reports expressed by proponents of the present scheme.

The number of Maritime members of the C.M.A. attending the annual meeting in Toronto was large, and this scribe considered himself lucky to be of this number this year after several years' absence. All things change, so it was amusing to pass unknown to classmates and other friends due apparently to continued loss of cranial hairy covering.

The chairman in charge of the Cancer diagnostic centres throughout the province met in Saint John in July for a two day session to review the work of their clinics and to study administrative and clinical problems

in the detection and diagnosis of malignant disease. Dr. J. B. Nugent was chairman of the round table discussions and demonstrations. Among those present were Dr. P. C. Laporte, of Edmundston, Dr. G. E. Chalmers of Fredericton, Dr. D. A. McLennan of Campbellton, Dr. D. A. Thompson of Bathurst, Dr. J. P. McInerney, Dr. R. A. H. McKeen, and Dr. A. S. Kirkland of Saint John.

A. STANLEY KIRKLAND

Manitoba

Altona's 30-bed hospital, which cost \$200,000 was formally opened on June 25 by Hon. Ivan Schultz, Minister of Health. It serves District 24 Manitoba Health Plan which has a population of 7,500. Dr. Steven Toni, who has practised at Altona for 10 years, is the head doctor of the new institution. Dr. Hugh McGavin of Plum Coulee, who has served the district for forty-six years, was one of the speakers.

Dr. and Mrs. H. G. Pickard of 129 Wildwood Park, Fort Garry, celebrated their golden wedding anniversary on June 22. They were married at Rothsay, Ont., June 22, 1898, and came to Minto, Man., in 1905. In 1916 Dr. Pickard moved to Oxbow, Sask., where he practised for 30 years until his retirement. Two of his sons are doctors—Harry has taken over his father's practice in Oxbow and E. W. is a plastic surgeon in Winnipeg.

On June 22, a farewell dinner was held at the Royal Alexandra Hotel to mark the retirement of Dr. F. A. Benner, as medical superintendent of Grace Hospital, Winnipeg. For sixteen years he served the hospital and has seen it treble its size. He was presented with a marble lamp and desk set. Brigadier V. Pearl Payton, superintendent, will leave early in July to be women's social secretary for the Salvation Army in Canada.

Applications are being received for the post of full-time teaching fellow in Anatomy in the Medical Faculty of the University of Manitoba.

A touring group of nine surgeons from the United States visited the Winnipeg General Hospital on June 29 and were later entertained at the home of Dr. C. W. Burns, Professor of Surgery.

Dauphin General Hospital was at home to visitors when the town of Dauphin celebrated its fiftieth anniversary recently.

Manitoba physicians are proud that Dr. F. W. Jackson, a native Manitoban, Deputy Minister of Health since 1931, has been called to Ottawa to act as director of health insurance studies for the Federal Government. The son of a pioneer legislator, Dr. Jackson practised at Wawanesa and served in the first World War until 1928 when he was asked by the Manitoba Government to make a health survey of the Province. A number of his medical friends tendered him a dinner on July 26, shortly before his departure for Ottawa. Dr. C. R. Donovan will succeed Dr. Jackson as acting deputy minister of health.

Dr. E. J. Rutledge, Progressive Conservative member in the Manitoba Legislature for Minnedosa, has resigned his seat to accept a position with the provincial health branch. He has been a member of the Legislature since 1927. He practised at Erickson and Baldur. It is expected that he will be appointed director of the Kildonan Health Unit.

The new Federal plan for assisting new hospitals is expected to prove a great benefit to Winnipeg hospitals now planned or under construction. These are

the new municipal hospital, the Princess Elizabeth for chronic cases; the maternity pavilion of the Winnipeg General Hospital, the proposed new Children's Hospital and the Shriners Hospital for Crippled Children.

ROSS MITCHELL

Ontario

Distinguished members of the British Empire Cancer Campaign visited Toronto, Vancouver and Ottawa to observe Canadian methods of controlling cancer and to inform Canadian colleagues of what is being done in Great Britain. Members of the party were: the Rt. Hon. the Lord Horder, G.C.V.O., M.D., F.R.C.P.; Professor B. W. Windeyer, F.R.C.S.E., F.F.R., and Mrs. Windeyer; Professor F. Dickens, Sir Stanford Cade and Lady Cade and Capt. F. B. Tours, O.B.E., R.N. (Ret.).

Lord Horder deplored the fear that is aroused in cancer publicity and does not think cancer symptoms should be specifically mentioned in advertisements. Sir Stanford Cade stated that he was not in favour of the establishment of Cancer Detection Clinics. The family doctor, in his opinion, is the best detector of cancer. Cancer research is being carried out in 14 hospitals in London, three in Birmingham, two in Cambridge, two in Edinburgh, two in Glasgow, two in Leeds, two in Manchester, two in Nottingham and in one hospital in the following cities, Bangor, Brighton, Bristol, Chester, Chichester, Liverpool, Newcastle-on-Tyne, Northampton, Oxford, Sheffield, Southampton and Wrexham. The B.E.C.C. hopes to raise one million pounds from the interested public in Great Britain to carry on the battle against cancer.

Dr. D. L. Bartelink of the University of Amsterdam, Holland, president of the Netherlands Radiological Society has been appointed director of the department of radiology at Victoria Public Hospital, London, Ont. He studied medicine at the University of Leiden and of Amsterdam, graduating in 1920. After two and a half years' postgraduate study of clinical medicine and surgery, he studied radiology under Dr. Heilbrant of Amsterdam and later at Paris, Vienna and Frankfurt. For 21 years he was chief radiologist at St. Canisius Hospital, Nijmegen, a six hundred bed hospital. His assistant in London will be Dr. Isadore Sedlezky now resident in radiology at Beth Israel Hospital, Boston. He served four years with the R.C.A.F. and studied radiology in Stockholm, Sweden.

A study conference in tissue culture was held for two weeks in July at the Connaught Laboratories under the direction of Dr. Raymond Parker of the University of Toronto staff. About a dozen workers in this field came from Johns Hopkins Hospital, Harvard Medical School, University of Chicago, New York College of Physicians and Surgeons and University of Toronto. Among those attending was Dr. Harry Eagle, scientific director of the American National Cancer Institute. The conference was sponsored by the Tissue Culture Commission of New York and was paid for by a special grant from the National Cancer Institute of Washington.

Major-General Sir Sahib Sing Sokhey, director-general of medical services of India was a recent visitor in Toronto.

The recently formed Ontario Public Health Association has sought affiliation with the Canadian Public Health Association. Officers elected were: Dr. Gordon P. Jackson, M.O.H., Toronto, president; Dr. R. A. Kelly, Peterborough, first vice-president; Dr. E. Ross Harris, Kirkland Lake-Larder Lake, second vice-president; and Dr. L. A. Pequegnat, Toronto, secretary-treasurer.

Dr. T. J. Pashby of Toronto has announced the opening of his office with practice limited to ophthalmology. He was with the R.C.A.F. for five years and later did postgraduate work in Toronto. Last January he presented at the Toronto Academy of Medicine the results of some studies he had made on the eyes of diabetic patients.

Dr. R. T. Noble and Mrs. Noble recently celebrated their fiftieth wedding anniversary.

Dr. S. A. S. Murkin, Nottingham, England, and twenty-seven other orthopaedic surgeons from United Kingdom spent forty-eight hours in Toronto as part of their continental tour following the convention of orthopaedic surgeons in Quebec, thirteen of the younger surgeons were sponsored by the Nuffield Trust.

The Medical Alumnae Association of Toronto elected the following officers at the annual meeting: honorary president, Dr. Marion Kerr; president, Dr. Dorothy Daley; first vice-president, Dr. G. C. Maloney; second vice-president, Dr. Helen Muir Wilson; third vice-president, Dr. Helen McKinley; fourth vice-president, Dr. Marion Ross; out-of-town vice-president, Dr. Elizabeth Stockdale Martin of Guelph; secretary, Dr. Alice Whiteside Gray; treasurer, Dr. Doris Prowse Denne.

LILLIAN A. CHASE

Saskatchewan

Very recent information that Dr. R. G. Ferguson is retiring as General Medical Superintendent of the Saskatchewan Anti-Tuberculosis League, has been received by the Saskatchewan Division. Dr. Ferguson has built up one of the most successful anti-tuberculosis programs, not only in Canada, but in the world. Although Saskatchewan claims him as their own, the whole profession of Canada will say, "thank you", for a job well done. We wish Dr. Ferguson every enjoyment of his newly found leisure time.

Dr. C. H. Stapleford is retiring from the staff of the Saskatchewan Hospital at Weyburn, and will reside at Westboro, near Ottawa.

At the annual Convocation of McGill University, held in Montreal on May 26, Dr. George F. Kipkie of Regina received the degree of Master of Science, and Dr. W. E. Upthegrove of Saskatoon, Diploma in Anaesthesia.

Dr. M. Dantow has taken over the duties of Saskatoon City Health Officer. Dr. Dantow was formerly with the Department of Public Health as Medical Health Officer of Health Region No. 13 at North Battleford.

Dr. L. M. Davey, who was Medical Health Officer for Health Region No. 1 at Swift Current has resigned his position and entered private practice in Alberta.

Dr. B. Bucove has resigned as Medical Health Officer for Health Region No. 3 at Weyburn and joined Dr. M. Rubin in practice at Foam Lake.

Dr. A. Wilson who retired several months ago from his position of Health Officer for the City of Saskatoon, has left with Mrs. Wilson to reside in Vancouver.

Dr. G. H. Hames was entertained recently at dinner by the Saskatoon and District Medical Society. Dr. Hames was for 18 years with the Tuberculosis League, and on the staff of the Saskatoon Sanatorium. He has accepted a position on the staff of Firland Sanatorium in Seattle, Wash. This is a new institution associated with the University.

Building of the medical college at the University of Saskatchewan is progressing nicely. The Caduceus has been placed above the main entrance. It is expected that sufficient progress will be made this summer to allow workmen to complete the interior of the lower floors this winter. The foundations for the University Hospital, immediately adjacent to the medical school are now being poured.

G. G. FERGUSON

General

Montreal Medico-Chirurgical Society Annual Fall Clinical Convention October 18 to 23 inclusive. Advance notice of meetings will be mailed to members. For information apply to the Montreal Medico-Chirurgical Society, 718 Medical Arts Building, Montreal.

International Congress on Rheumatic Disease. The first post war International Congress on Rheumatic Diseases is to be held at the Waldorf Astoria Hotel, New York City, from May 30 to June 3, 1949. This meeting is sponsored by the International League against Rheumatism and the American Rheumatism Association is acting as host. Funds have been obtained by subscription from members of this organization and others to enable prominent European rheumatologists and research workers to be present. The Canadian Rheumatism Association is an affiliate. It is expected that the meeting in New York will be outstanding. The three official languages will be English, French and Spanish. It is hoped to employ earphones, as presently used by the United Nations, which will permit of immediate translation into the two other official languages.

Reservations can be obtained in nearby hotels for a daily minimum of \$6.00. Obviously arrangements for such a meeting must be made well in advance. Enquiries are invited by the president and secretary-treasurer of the Canadian Rheumatism Association. President: H. P. Wright, 1414 Drummond St., Montreal, Que. Secretary-Treasurer: Dr. D. C. Graham, 3 Crandall Rd., Toronto, Ont.

Britain's Charter of Social Security. Revised figures now available permit of the following estimates: The combined cost of National Insurance and National Assistance during the first year is estimated at £519 million, of this total £315 million will be met by insurance contribution, another £21 million by interest on the Reserve Fund and £183 million will fall on the Exchequer to be met from taxation. The Exchequer will contribute another £60 million to meet the cost of Family Allowances. It is estimated that the cost of the Industrial Injuries Scheme, when it reaches maturity, will rise to £29 million a year, of which £5 million will come from taxes and £24 million from employers and workers equally. No comprehensive estimate is yet available for the National Health Service but the probable cost in England and Wales alone for the first nine months is put at £180 million, of which about three-quarters must be met from taxes and local taxes. The cost is expected to rise steeply as more people qualify.

In recognition of his studies on "Sludged Blood" the College of Physicians awarded on July 14, 1948, the Alvarenga Prize for this year to Melvin H. Knisely, M.D., of the University of Chicago. The Alvarenga Prize was established by the will of Pedro Francisco da Costa Alvarenga of Lisbon, Portugal, an Associate Fellow of the College of Physicians of Philadelphia, "to be awarded annually by the College of Physicians on each anniversary of the death of the testator, July 14, 1883. The College usually makes this award for outstanding work and invites the recipient to deliver an Alvarenga Lecture before the College.

We are informed that a new annual review of medical progress is to be issued, entitled *Medicine of the Year*. This is to be under the editorial management

FALL GRADUATE INSTRUCTIONAL COURSE IN ALLERGY

THE AMERICAN COLLEGE OF ALLERGISTS

University of Oregon Medical School, Portland, Oregon

November 8 - 12, 1948 inclusive

SCHEDULE OF SUBJECTS AND FACULTY

MONDAY, NOVEMBER 8

Fundamentals of Allergy and Miscellaneous Manifestations

A.M.

- 8:30-9:30—Registration
9:30-9:45—Address of Welcome: David Baird, M.D., Dean, University of Oregon Medical School, Portland, Oregon.
9:45-10:40—Bronchial Asthma—Diagnosis: Harry L. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.
10:45-11:35—Bronchial Asthma—Treatment: Harry L. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.
11:45-12:30—Immunological Aspects of Allergy: Harry Sears, Ph.D., Professor of Bacteriology, University of Oregon Medical School, Portland, Oregon.

P.M.

- 2:00-2:55—The Physiology of Allergy: William Youmans, M.D., Professor of Physiology, University of Oregon Medical School, Portland, Oregon.
3:00-3:55—Pharmacology of Drugs Used in Allergy: Norman A. Davis, M.D., Professor of Pharmacology, University of Oregon Medical School, Portland, Oregon.
4:00-4:25—Cardiac Asthma: Howard Lewis, M.D., Professor of Medicine, University of Oregon Medical School, Portland, Oregon.
4:30-5:00—Ulcerative Colitis: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
7:00—Informal Dinner—Speaker: George E. Rockwell, M.D., President, The American College of Allergists.

TUESDAY, NOVEMBER 9

Gastro-Intestinal and Food Allergy

A.M.

- 9:00-9:40—Food Allergy: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
9:45-10:25—Migraine: J. Warrick Thomas, M.D., Thomas Clinic, Richmond, Virginia.
10:30-11:10—Elimination Diet for the Diagnosis and Control of Food Allergy: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
11:15-11:55—Dietary Management of Food Sensitive Patients: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
12:00-12:30—Bacterial Allergy: Robert Louis Benson, M.D., Clinical Professor, University of Oregon Medical School, Portland, Oregon.

Clinical Allergy

P.M.

- 2:00-2:30—Skin Test—Demonstration: Roy Matteri, M.D., Clinical Instructor, University of Oregon Medical School, Portland, Oregon.
2:30-5:00—Clinical Session (Skin Testing, Technique, and Interpretation and Demonstration of Preparation of Extracts): Merle W. Moore, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.

WEDNESDAY, NOVEMBER 10

Dermatologic Allergy

A.M.

- 9:00-10:35—Allergic Dermatoses—Atopic and Contact Dermatitis: A. Rostenberg, Jr., M.D., Associate Professor of Dermatology, University of Illinois College of Medicine, Chicago, Illinois.
10:40-11:10—Urticaria and Angioneurotic Edema: Merle W. Moore, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.
11:15-11:45—Drug Allergy: George E. Rockwell, M.D., President, The American College of Allergists, Milford, Ohio.
11:50-12:50—General Principles of Cutaneous Allergy Therapy, Including Emergency Skin Manifestations: A. Rostenberg, Jr., M.D., Associate Professor of Dermatology, University of Illinois College of Medicine, Chicago, Illinois.

Pediatric Allergy

P.M.

- 2:00-2:40—Infantile Eczema: M. Murray Peshkin, M.D., Instructor, College of Physicians and Surgeons, Postgraduate Medical Extension, Columbia University, New York, New York.
2:45-3:25—Management of the Pre-Allergic Child: M. Murray Peshkin, M.D., Instructor, College of Physicians and Surgeons, Postgraduate Medical Extension, Columbia University, New York, New York.
3:30-4:10—Characteristics of the Allergic Child: Norman W. Clein, M.D., Director of Children's Clinic, Chief of Pediatric Services, Kings County Hospital, Seattle, Washington.
4:15-5:00—Special Problems in Treatment and Management of Asthma in Children: M. Murray Peshkin, M.D., Instructor, College of Physicians and Surgeons, Postgraduate Medical Extension, Columbia University, New York, New York.
8:00-10:00—Evening Informal Discussion Groups: Albert H. Rowe, M.D., General Chairman.

THURSDAY, NOVEMBER 11

Miscellaneous Manifestations of Allergy

A.M.

- 9:00-9:40—Unusual and Obscure Conditions of Allergy: Orval R. Withers, M.D., Associate Professor of Medicine, School of Medicine, University of Kansas, Kansas City, Kansas.
9:45-10:25—Ocular Allergy: J. Warrick Thomas, M.D., Thomas Clinic, Richmond, Virginia.
10:30-11:10—Physical Allergy: Frank Perlman, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.
11:15-12:00—Cerebral Manifestations of Allergy Including Aural Allergy: Harry L. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.

P.M.

- 2:00-2:30—Present Status of Antihistaminic Drugs: George E. Rockwell, M.D., Milford, Ohio.
2:35-3:25—Allergic Bronchitis, Bronchiectasis and Loeffler's Syndrome: Harry L. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.
3:30-4:25—Vascular Allergy: Hyman Miller, M.D., Assistant Clinical Professor of Medicine in Allergy, University of Southern California, Los Angeles, California.
4:30-5:00—Joint Allergy: Robert Louis Benson, M.D., Clinical Professor, University of Oregon Medical School, Portland, Oregon.
8:00-10:00—Evening Informal Discussion Groups: Albert H. Rowe, M.D., General Chairman.

FRIDAY, NOVEMBER 12

Respiratory and Miscellaneous Allergies

A.M.

- 9:00-9:30—The Botany of Hay Fever Plants: James E. Stroh, M.D., Assistant Clinical Professor of Medicine, Head of the Department of Allergy, University of Washington School of Medicine, Seattle, Washington.
9:35-10:25—Hay Fever—Diagnosis, Treatment and Management: Merle W. Moore, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.
10:30-11:25—Mold Allergy: Symptoms, Diagnosis and Treatment: Fred W. Wittich, M.D., Secretary-Treasurer, The American College of Allergists, Minneapolis, Minnesota.
11:30-12:00—Perennial Allergic Rhinitis: Orval R. Withers, M.D., Associate Professor of Medicine, School of Medicine, University of Kansas, Kansas City, Kansas.
12:05-12:30—Pollen Counts and Demonstration (Photomicrograph Illustrations): Frank Perlman, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon, and James E. Stroh, M.D., Assistant Clinical Professor of Medicine, Head of the Department of Allergy, University of Washington School of Medicine, Seattle, Washington.

P.M.

- 2:00-2:55—Pathology of Asthma: Warren Hunter, M.D., Professor of Pathology, University of Oregon Medical School, Portland, Oregon.
3:00-3:50—Basic Principles of Allergy: Fred W. Wittich, M.D., Secretary-Treasurer, The American College of Allergists, Minneapolis, Minnesota.
3:55-4:25—Treatment of Status Asthmaticus: J. Warrick Thomas, M.D., Thomas Clinic, Richmond, Virginia.
4:30-5:30—X-ray Diagnosis and Therapy: Ivan Woolley, M.D., Clinical Associate, University of Oregon Medical School, Portland, Oregon.

The fee for the course is \$75.00 payable at the registration desk, University of Oregon Medical School, Portland, Oregon. Headquarters is at the Heathman Hotel. Applications for the course and a postcard giving hotel rates addressed to the Heathman Hotel will be sent to you by writing to the Secretary, Dr. Fred W. Wittich, The American College of Allergists, 423 LaSalle Medical Building, Minneapolis 2, Minnesota.

and direction of Dr. John B. Youmans, Dean and Professor of Medicine, University of Illinois. The contributors will include such well known writers as Dr. Hugh J. Morgan of Vanderbilt University; Dr. Frank Whitacre, Memphis, Tennessee; Dr. Henry G. Poncher, Chicago, Illinois; and Dr. Warren H. Cole, Chicago, Illinois. The review will cover the general progress in medicine during the preceding year, and will be about 100 to 120 pages. The subscription price is \$1.50 per annum. It is requested that those desiring to contribute send in their names to Dr. Youmans no later than January 1, 1949.

BOOK REVIEWS

Modern Trends in Ophthalmology. Edited by Arnold Sorsby. Vol. II. 600 pp., illust. \$18.50. Butterworth & Co. (Publishers) Ltd., Bell Yard, Temple Bar, London, 1948.

This volume follows much the same pattern as Vol. I, which appeared in 1940. In a series of chapters by noted authors the recent advances in ophthalmology and allied sciences are reviewed and consolidated. Such diversity of subjects are dealt with as the physics of light, the physiology of vision, therapeutics, surgery, and industrial ophthalmology. As should be the case, advances made owing to the opportunities and stimulation of the war have been generously included. The whole forms a most valuable addition to ophthalmic literature. It will be particularly valuable to those ophthalmologists who, owing to the pressure of duty during the past crowded years, have not been able to keep up with their reading in current journals. The material is well ordered and written. The illustrations are numerous and well chosen.

Modern Trends in Dermatology. Edited by R. M. B. MacKenna, Physician in charge, dermatological department, and lecturer in dermatology, St. Bartholomew's Hospital, London. 432 pp., illust. \$12.50. Butterworth & Co. (Publishers) Ltd., Bell Yard, Temple Bar, W.C.2, London, 1948.

Here is something new and different: a book which attempts to correlate the advances that have been and are being made in Dermatology and where they are leading us. The morphological era in Dermatology has been a full and successful one but has now given way to the functional one. The Editor of this volume has attempted to ascertain the principal modern trends in Dermatology. He has delegated the task to men, only a few of whom are dermatologists, the majority being experts in allied fields. The first chapter opens with a general review of the past and present basic investigative work in Dermatology with thoughts for the future. The next eight chapters are devoted to the anatomy, physiology and functional pathology, nutrition, bio-chemistry and bacteriology of the skin. Then comes a series of chapters on various clinical problems among which are those on the hormones, parasitology, mycology, the occupational dermatoses, the tropical diseases and finally atrophies and scleroses of the skin. The chapter on the modern trends in therapy is interesting; those on the prevention of cutaneous diseases show a real appreciation and a need for rehabilitation of the patients from both the psychological as well as the physical aspects. The chapter on statistics, somewhat technical, should be read by all who attempt to give statistical surveys of disease. A better realization of the inherent errors possible in such studies is obtained.

The rôle played by psychic disturbances in production of various dermatoses is, in the opinion of the reviewer, greatly over-emphasized. Just as dermatologists tend to under-emphasize personality changes, the psychiatrist has certainly gone to the opposite extreme. Much more and better controlled work in this field is badly needed. The reviewer was tremendously stimulated by this volume. He found a correlation of

studies nowhere else to be found. It should be of interest to all dermatologists and particularly those who are engaged in the field of investigative dermatology.

Gardiner's Handbook of Skin Diseases. Revised by J. Kinnear, Lecturer in Diseases of the Skin, St. Andrew's University. 265 pp., illust. \$3.75. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada, Toronto, 1948.

The latest edition of this popular handbook deserves more than passing notice. It is brief. It can be read through with attention in two hours. It is thoroughly up-to-date, such recent advances as the use of calciferol in lupus vulgaris, BAL in heavy metal poisoning, the dangers attending indiscriminate topical use of the sulfonamides, modern views on the question of allergy and sensitization, all receiving adequate consideration. Its practical, common-sense approach is indicated by such a remark as "The secret of successful local treatment of diseases of the skin lies in the recognition of the state of the skin as much as, if not more than, in the diagnosis of the actual disease". Criticism might be made of the recommendation that wet dressings used in acute inflammations should be covered with jaconet, and the failure in discussing the diagnosis of primary syphilis, to call attention to the sero-negative stage of the primary lesion in its incipency, when reliance should be placed entirely upon the dark field examination and never solely on the reaction of the blood serum. The illustrations, both black and white and Dufaycolor photographs are numerous, excellently done and representative, but the few coloured illustrations from moulages might have been omitted. This is an excellent book for the student and the general practitioner and he can rarely go wrong in following its guidance.

Gynæcological and Obstetrical Urology. H. S. Everett, Associate Professor of Gynæcology, the Johns Hopkins University. 556 pp., illust., 2nd ed. \$6.00. The Williams & Wilkins Co., Baltimore, 1947.

This is a good book. It is well printed on good paper and is extensively illustrated with good cuts. There are a small number of typographical errors, including one on the second line of the first page, but no more than most books have. It deals with most of the surgical diseases of the urinary tract which occur in women, and thus includes discussion of certain conditions which are related to obstetrics and gynæcology only by coincidence. The sections on cystoscopy and on bladder tumours have been added to, or considerably revised from the first edition.

As might be expected in a book from this university, considerable attention is paid to the opinions of Guy Hunner; while these opinions are not entirely accepted by present-day urologists, they are well and fairly presented in the book. The section on Hunner ulcer does not appear to have been revised, as it does not discuss treatment by the presently accepted method, with silver nitrate solution and percain. The author has chosen to discuss enuresis, but does not mention the use of amphetamines in its management. The book is recommended to practitioners in the fields concerned.

Heart—A Physiologic and Clinical Study of Cardiovascular Diseases. Aldo A. Luisada, Instructor in Physiology and Pharmacology, Tufts College Medical School, Lecturer in Medicine; Lecturer, Postgraduate Division, Tufts College Medical School, Ferrara, Italy. With a foreword by Herrman L. Blumgart, Physician-in-Chief, Beth Israel Hospital. 653 pp., illust. \$10. The Williams & Wilkins Co., Baltimore; The University of Toronto Press, Toronto, 1948.

This book was written with the intention of making available to the general practitioner a broad base of information on the cardiovascular system. For this task Dr. Luisada is eminently suited, for he combines a detailed knowledge of cardiology with a background

Three to Four-Day Blood Levels . . .

PROCAINE PENICILLIN G IN OIL

With Aluminium Monostearate, 2%

The inclusion of aluminium monostearate in crystalline procaine penicillin G in oil, together with other improvements in the method of preparation, now makes it possible to prolong the absorption of penicillin and to maintain therapeutic penicillin blood levels for *three or even four days* in the great majority of patients.

The recommended dosage of 1 cc. (300,000 units) every 48 hours has been found to be adequate in most cases, thus overcoming the necessity of injections once or twice every 24 hours with other forms of prolonged-acting penicillin.

HOW SUPPLIED

1-cc. cartridges, each containing 300,000 International Units of Procaine Penicillin G in Oil, for use with* B-D* disposable plastic syringes or as replacements for B-D* metal cartridge syringes.

10-cc. vials, each containing 3,000,000 International Units.

*T.M. Reg. Becton, Dickinson & Co.



CONNAUGHT MEDICAL RESEARCH LABORATORIES

University of Toronto

Toronto 4, Canada

of laboratory investigation. In part, the aim of the author has been achieved in that the reader will undoubtedly learn much about the heart and heart disease which he did not know before, but it is doubtful whether this is the best possible book which could have been written on the subject. In many cases findings are not explained as clearly as they might be. In the description of various syndromes and diseases there is a tendency for signs and symptoms to be presented first, with a short explanation for their mechanism of production attempted later. This is particularly unsatisfactory in a subject such as this, where an understanding of the mechanism at once gives the clinician an appreciation of the signs and symptoms which are to be expected. Further, in the subject of cardiology, both physiology and pharmacology have contributed particularly heavily so that we have passed beyond the stage of cataloguing signs and empirically listing therapy. The book is, however, very thorough and there is sufficient merit in the presentation to repay careful reading.

Illustrative Electrocardiography. J. Burstein, Visiting Electrocardiographer and Chief of the Cardiac Clinic, Morrisania City Hospital, New York; and N. Bloom, Associate Professor of Medicine and Chief of the Department of Electrocardiography, Medical College of Virginia, Richmond, Virginia. 309 pp., illust. \$6.00. D. Appleton-Century Co., New York, 1948.

This edition presents considerable revision, and practically all of the electrocardiographic plates are new. A chapter has been added dealing with Radiology of the Heart, by Dr. Philip Slater, which is of an elementary nature. There are a number of items of interest which are omitted in this third edition. For example, there is a chapter on the use of multiple precordial leads but with few exceptions the illustrative plates show only a single "lead iv". There is but a sentence referring to the possible use of the precordial lead pattern in the diagnosis of right and left ventricular hypertrophy, although there are short sections dealing with ventricular "strain". Little attention has been given to electrocardiography in congenital heart disease. It is felt that such omissions lessen the value of this book.

Man—Weather—Sun. W. F. Petersen. 493 pp., illust. \$12.50. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1947.

During the past fifteen years Dr. Petersen has published a series of volumes under the general title of "The Patient and the Weather". These books contain a large mass of statistical and clinical material that does not lend itself to any simple interpretation. With the announcement of this comparatively small volume, one might have hoped that some readily intelligible analysis and summary might be made. However, as the author states, the pathway to his various conclusions is still devious and involved and it is difficult to find one's way through much of the argument presented. This book does not throw much light on the problems that are the special concern to the practising physician.

Neurology of the Ocular Muscles. D. G. Cogan, Associate Professor of Ophthalmology, Harvard Medical School. 225 pp., illust. \$7.50. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1948.

In recent years there has been a tremendous advance in our understanding of the oculorotary muscles, but with all this volume of new material, new ideas, and new methods, there was no new textbook in which it was properly sifted out and presented so that it could be intelligently grasped by the student of ophthalmology, until in 1947 Dr. Richard G. Scobee introduced his superb book, "The Oculorotary Muscles", which is destined to become a classic. Now

Dr. Cogan's book appears on the scene to bridge the remaining gap between ophthalmology and neurology. This is a book essentially for the neuro-ophthalmologist. It goes much further into the realm of neurology than does Scobee and is a valuable adjunct to the library of both ophthalmologist and neurologist. To quote the author, the book "attempts to correlate the clinical manifestations of disturbances of the ocular motor system with its neuroanatomic and neurophysiologic architecture" . . . it presents "the physiologic and anatomic bases for the ocular motor disturbances as indissociable from the clinical manifestations"; . . . "the data are arranged according to objective signs rather than disease entities". The book deals essentially with the localization of the site of a lesion and "only secondarily with the nature of the underlying disease process". As the neuro-ophthalmologist is rarely asked to do more than localize the site, "the text is so arranged as to emphasize analysis of localizing signs and symptoms and little or no space is given to treatment". The greater part of the book is taken up with the supranuclear connections of the ocular motor system. It concludes with an excellent chapter on Nystagmus and an imposing list of 825 references.

Organic Form and Related Biological Problems. Samuel J. Holmes. 169 pp. \$5.00. University of California Press, Berkeley and Los Angeles, 1948.

For all who are interested in fundamental problems of growth and development, and particularly for those who as students attempted to evaluate the arguments of Holmes, great satisfaction is to be found in this, his most recent book. It is noteworthy that a man towards the close of a long career should still be modifying his working hypotheses and fitting them in with the most recent findings of modern genetics. Holmes points out very clearly that any analysis of development and differentiation must rest ultimately on the nature of the hereditary materials, the genes. The discussion also carries on into the more recent field of autocatalytic enzymes and viruses.

Medico-Legal Problems. Edited by S. A. Levinson, University of Illinois College of Medicine for the Committees of the Institute of Medicine and the Chicago Bar Association. 255 pp. illust. \$6.00. J. B. Lippincott Co., Philadelphia, London and Montreal, 1948.

This is a record of prepared discussions and question and answer periods between a medical and a bar association with subjects of current interest which are puzzling both groups. The subjects are live, but the discussions can scarcely be considered so—for Canadians at least. "The Medical Witness in Court—Expert Testimony" is given over largely to the statement of abuses in Illinois Courts and suggestions for their remedy. "Artificial Insemination: Its Medico-Legal Implications" deals with reasons and indications for the procedure, methods and technique, and leaves the question of legal safeguards and safety exactly as it was before the discussion—there being no laws or precedents to use as guides. The whole question, medical, legal and moral is presented and many ramifications are noted. "The Practice of Pathology and Its Medico-Legal Aspects" demonstrates so many differences between various American laws and between American and Canadian laws that it might easily be misleading to a Canadian physician. The same is true of "Operations to Produce Sterility: Medico-Legal Implications." "Trauma and Tumours in Industrial Medicine"—in which is discussed the relation between any trauma and any subsequent tumours or metastases—deals with and demonstrates the wide differences between the legal and the scientific methods of trying to prove a truth, and fails to arrive at the truth. This may be a better book than the reviewer thinks it is, but its value to a Canadian physician without a legal background is slight—and it may actually be misleading.

delayed action

Ciba research has produced a new running-mate to its antihistaminic line — **PYRIBENZAMINE Delayed Action Tablets**. The unique feature of these tablets is a special protective coating (not enteric) which delays the action of the drug from *four to six hours*. Then, when the effect of the normal uncoated tablet wanes, that of the new product springs into action like a fresh relay runner.

The advantages from the physician's, and above all, the patient's point of view are obvious. To the doctor, these tablets represent a safe, effective means of prolonging the action of a drug he is confidently prescribing; to the patient, uninterrupted relief of allergic symptoms *throughout* the night.

Available at all pharmacies, in bottles of 50 and 500, 50 mgms. tablets.

*Pyribenzamine**

delayed action TABLETS

Ciba's brand of tripeleannamine Hydrochloride



Ciba

COMPANY LIMITED MONTREAL



*TRADE MARK REGD.



Peripheral Vascular Diseases. D. W. Kramer, Associate Professor of Medicine, Jefferson Medical College. 634 pp., illust. \$8.00. F. A. Davis Co., Philadelphia, 1948.

This book is the second text on this specialty to appear in the last two years where previously there were none, a fact which indicates the increasing interest in vascular diseases. The author has taken great pains to gather his material in a systematic manner, a point which will be appreciated by those using this book for reference. The chapters on investigation and diagnosis are clearly set out and mention all the tests at present in use. However too much space is given to the clinically seldom used methods of plethysmography, radio active isotopes and other rare methods of investigation and too little to the commonly employed procaine block of the appropriate section of the sympathetic chain. It would appear that the author has been too anxious to be up to date because space is given to unproved tests and therapy (such as the use of tetraethylammonium also vitamin C and histadiné) which will probably be little used in the future. The descriptions of the occlusive arterial diseases, the spastic arterial lesions and the disorders of veins are well done and copiously illustrated with good photographs and case reports. The treatment sections contain many good suggestions but these are almost entirely of a medical nature and little space is devoted to the surgical management of these diseases. The book would have been improved if the author (who is a medical specialist) had collaborated with a vascular surgeon. This lack is also evident in the absence of any mention of arterial injuries and methods of sympathectomy.

However, despite these shortcomings, this book is a welcome addition to the field of peripheral vascular diseases. It will be of most use to the medical practi-

tioner who wishes to expand his knowledge in this specialty and to the student who is looking for a worth while text on this subject.

BOOKS RECEIVED

Medical Research in War. Report of the Medical Research Council for the Years 1939-45. 455 pp. 7s. 6d. His Majesty's Stationery Office, London, 1948.

Poisons. F. Bamford, late Director of the Medico-Legal Laboratory, Cairo. Second edition revised by C. P. Stewart, Reader in Clinical Chemistry, University of Edinburgh. 304 pp., illust., 2nd ed. \$5.75. The Blakiston Co., Philadelphia and Toronto, 1947.

Recent Advances in Medicine. G. E. Beaumont, Physician to the Middlesex Hospital; and E. C. Dodds, Courtauld Professor of Biochemistry in the University of London. 422 pp., illust., 12th ed. \$7.00. The Blakiston Co., Philadelphia and Toronto, 1947.

Recent Advances in Sex and Reproductive Physiology. J. M. Robson, Reader in Pharmacology, Guy's Hospital Medical School, University of London. 336 pp., illust., 3rd ed. \$5.75. The Blakiston Co., Philadelphia and Toronto, 1947.

Rheology in Relation to Pharmacy and Medicine. G. W. Scott Blair, National Institute for Research in Dairying, University of Reading. 19 pp. 2s. 0d. The Pharmaceutical Press, 17 Bloomsbury Square, W.C.1, London.

Tuberculosis in the Commonwealth 1947. 328 pp. 15s. National Association for the Prevention of Tuberculosis, London, W.C.1, England.

H. K. LEWIS & Co. Ltd.

MEDICAL PUBLISHERS and BOOKSELLERS
LARGE STOCK OF WORKS ON
MEDICINE AND GENERAL SCIENCE
of all publishers.

SECOND-HAND DEPT.: 140, Gower Street, London, W.C.1.
Large stock of recent editions. Rare and out-of-print books sought for and reported free of charge.

LONDON: 136 GOWER STREET, W.C.1.
CABLEGRAMS:—PUBLICAVIT WESTCENT—LONDON

UNIVERSITY OF TORONTO SCHOOL OF HYGIENE

Diploma in Hospital Administration

A postgraduate course in hospital administration for graduates in medicine and also for other university graduates who have acceptable academic standing, experience and aptitude, providing one session of nine months and twelve months of supervised hospital experience as an intern in hospital administration.

For further information, address
The Director, School of Hygiene
University of Toronto, Toronto 5, Ontario

FELLOWSHIP OF POSTGRADUATE MEDICINE

1, Wimpole Street, London, W. 1.

with which is associated many of the General and Special Hospitals in London, is making every effort to provide postgraduate instruction and will be glad to give information regarding the facilities available. It must, however, be understood that facilities are still greatly curtailed.

It is still impossible to arrange and publish the usual list of instruction for the whole year. Courses are arranged as it is found practicable to do so, and special attention is paid to the requirements of candidates for the M.R.C.P. (London) and F.R.C.S. (England) examinations.

Courses arranged by the Fellowship of Postgraduate Medicine are open only to Members; annual subscription from month of joining, 10/6d.

The "Overseas Postgraduate Medical Journal" is published quarterly; annual subscription, 30/-, post free.

MAURICE DAVIDSON, M.D., F.R.C.P.,
DAVID LEVI, M.S., F.R.C.S.
Honorary Secretaries